

MARINE RECORD

ESTABLISHED 1878.

VOL. XXII, No. 39.

CLEVELAND---SEPTEMBER 28, 1899---CHICAGO.

\$2.00 Per Year. 5c. Single Copy.

LAKE CARRIERS' ASSOCIATION.

To consider and take action upon all general questions relating to the navigation and carrying business of the Great Lakes, maintain necessary shipping offices and in general to protect the common interests of Lake Carriers, and improve the character of the service rendered to the public.

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MAINTAIN THE LAKE LEVELS - PROJECTED CANALS MUST NOT BE PERMITTED TO INJURE TRANSPORTATION INTERESTS-AN IMPORTANT NATIONAL QUESTION.

Frank J. Firth, president of the Lake Carriers' Association, at the request of the Detroit Journal, has written the following letter upon the subject of the maintenance of the lake levels:

Editor The Journal, Detroit, Mich.: You invite a communication upon the subject of maintaining "lake levels." In the MARINE RECORD, July 20, 1899, I said:

"It is time for those interested in maintaining lake, and, if possible, increasing the lake levels, to advocate and obtain the appointment of an international commission of able United States and Canadian engineers to carefully investigate and consider this entire question, recommending to their respective governments a permanent policy that may protect the interests of lake navigators without needlessly restricting important private enterprises desiring to utilize for power or other useful purposes the waters of the Great Lakes. It is a question affecting all the producers and consumers of grain, ore, lumber, coal and other staples depending upon the Great Lakes for their cheap movement to the home and foreign markets."

Lake navigators are not so narrow minded as to wish to needlessly restrict the use by important private enterprises of the waters of the Great Lakes. The right of each such enterprise to exist must, however, depend upon its absolutely safe guarding navigation interests. The single community of Chicago, important as it is, and deeply interested as we all are in its sanitary conditions, cannot be allowed to execute a plan of its own without due consideration as to the effect of this plan upon the millions of our population dependent directly or indirectly upon the maintenance of the cheap transportation service afforded by the Great Lakes. In providing for her own needs Chicago must safeguard the interests of others.

The "Soo" power canals represent modern methods of utilizing water power, and promise great benefit to the section of country in which they are located, but not one drop of water can be permitted to pass through these canals until remedial works have been constructed and their maintenance provided for, so that the levels may be maintained above and below the canals, and no injury made possible to

navigation interests either by current in the river at the outflow or otherwise. It is just to say the owners of the "Soo" canals state that they will not allow any water to enter the canals now constructing until the United States government and the Lake Carriers' Association are satisfied with the provision made for remedial works.

The recently proposed open cut canal from Lake St. Clair to Lake Erie would pass wholly through Canadian territory, and might perhaps be a useful aid to navigation under certain conditions and restrictions, but it cannot be operated without the consent of the United States, and that consent cannot be obtained until it is absolutely certain provision has been made to prevent the lowering of the levels above the canal or in the river below its inlet.

These are merely illustrations of a class of enterprise that have much to commend them, but that must depend for their right to exist upon the ability of their projectors to make it absolutely certain they will in no way interfere with the cheap carrying service of the Great Lakes. The United States has expended, and must continue to expend, many millions of dollars in deepening, protecting, buoying and lighting the lake waterways. This is done because each inch the lake vessels can add to their depth of loading means a cheapening of the food products of the farm in the markets of the world. It means an increased economy in the manufacture of the products of iron ore and widening the range of markets our country can enter in competition with all the world. It means cheaper fuel to the entire west and northwest. It means increased prosperity to the entire country. All of these results are dependent upon the depth of water in the harbors of, and in the straits connecting, the Great Lakes, measured even in such small varying levels as are indicated by inches.

The United States government cannot allow these great results to be jeopardized even to drain the Chicago river; to utilize the dormant power in the "Soo" rapids; or to place our Canadian friends in position to levy a canal toll on the tonnage passing between Lake St. Clair and Lake Erie. We do not condemn these enterprises, but we do demand that their right to exist shall depend upon their not in any way whatever imperiling lake navigation interests. No more important national question will engage the attention of Congress at its coming session.

FRANK J. FIRTH.

Philadelphia, Sept. 21, 1899.

THE COLUMBIA-SHAMROCK RACE.

An act of Congress was passed in 1896 designed to protect racing yachts, while sailing a race, from the crowding which endangers life on excursion vessels and prevents the contesting boats from a fair trial of speed. The act provides as follows: "That in order to provide for the safety of passengers on excursion steamers, yachts, oarsmen and all craft, whether as observers or participants taking part in regattas, amateur or professional, that may hereafter be held on navigable waters, the Secretary of the Treasury be, and is hereby authorized and empowered in his discretion to detail revenue cutters to enforce such rules as may be adopted to insure the safety of passengers on said excursion steamers, yachts, oarsmen and all craft, whether as observers or participants in such regattas."

Capt. Robley D. Evans, U. S. N., assisted by Lieutenant Commander Fremont, supervisor of the harbor of New York, will be in charge of the work of carrying out the provisions of the above law. The officers will be in command of several torpedo boats, revenue cutters and other vessels, which, together will form quite a formidable fleet, and will determine the question if a yacht race can be run near New York harbor in a manner that will insure safety and fairness.

LAKE CARRIERS' ASSOCIATION.

At a meeting of the executive committee of the Lake Carriers' Association, held at the office of Capt. James Corrigan, Cleveland, on Monday, a revised schedule of wages was adopted and an advance was made all around. The new schedule, which goes into effect Oct. 1, is the highest that has been paid on the lakes for a number of years. The wages of the engineers and mates were marked up 20 per cent. and the other men were granted an advance of 10 per cent. On Aug. 15 an advance of 10 per cent. was paid all the men below mates. So that the new schedule gives all the men employed on the vessels enrolled under the rules of the Lake Carriers' Association an advance of 20 per cent. since the opening of the season. The new schedule is as follows:

ON STEAMERS.

First-class.	Per month.
Chief engineers.....	\$132 00
Second engineers.....	90 00
First mates.....	96 00
Second mates.....	66 00
Cooks.....	66 00
Helpers to cooks.....	24 20
Firemen.....	42 35
Wheelmen.....	42 35
Lookouts.....	42 35
Oilers.....	42 35
Deckhands.....	24 20
Second-class.	
Chief engineers.....	\$114 00
Second engineers.....	84 00
First mates.....	84 00
Second mates.....	54 00
Cooks.....	60 50
Helpers to cooks.....	20 57
Firemen.....	42 35
Wheelmen.....	42 35
Lookouts.....	42 35
Deckhands.....	24 20
Third-class.	
Chief engineers.....	\$78 00 to \$96 00
Second engineers.....	66 00
First mates.....	66 00 to 78 00
Cooks.....	55 00
Firemen.....	36 30 to 42 35
Wheelmen.....	36 30 to 42 35
Lookouts.....	36 30 to 42 35
Deckhands.....	24 20

ON CONSORTS AND SAIL.

First-class.	Per month.
First mates.....	\$60 00
Second mates.....	48 00
Cooks.....	42 35
Seamen.....	42 35
Second-class.	
First mates.....	\$42 00 to \$54 00
Cooks.....	36 30
Seamen.....	33 00 to 36 30

The foregoing rates will be printed as usual on cards and forwarded to all owners of vessels who are members of the Association.

CANADIAN INSPECTION FEES.

Acting Secretary of the Treasury Spaulding has advised collectors of customs at ports on the Great Lakes that taxes on tonnage of steam vessels which have been imposed since January 1st, as inspection fees by Canadian authorities in the province of Ontario, will no longer be collected.

This action is the result of a protest filed by Gen. Spaulding last month with the Department of State that these so-called inspection fees were in contradiction of the agreement by which Canadian vessels entering the United States from Ontario are exempt from tonnage taxes.

The Governor-General of Canada stated that the Ontario officials have erroneously construed the Canadian steamboat act, and that instructions have been issued for a refund of fees paid by American vessels since January 1st.



BUFFALO.

Special Correspondence to The Marine Record.

How about closing a harbor? Tell us why Toledo should be pronounced an unsafe place for vessels drawing over fifteen feet.

The schooner Emery, with bituminous coal, Charlotte to Kingston, dragged from her anchor and is now considered a total loss lying of Bar Creek.

Directors of the Lorain Steamship Co. held a meeting here on Saturday. Capt. M. M. Drake was elected president and M. W. Mason secretary and treasurer.

The steamer Buffalo, Capt. Murphy, could not expect but bad luck on his first trip after the break that Gaskin made on the launch, he has had the bad luck and may be discharged for it but Gaskin won't help him out any.

Specifications for the new light-house station to cost \$50,000 will be forwarded to Washington this week for consideration by the Light-House Board. It is expected that the work on the new station will be done during the winter under charge of the engineer of this district detailed by the War Department.

The late stockholders of Hand and Johnson's tug line presented to Councilman James Ash, president of the line, a fine silver service on his retirement from the local tug line, with which he had been connected since 1866. The captain is one of the best men in the business and the working hands are sorry to see him retire.

The Delaware, Lackawanna & Western Coal Co. has orders for the shipment of 200,000 tons of coal westward from Oswego, but cannot secure vessels to carry it. The rate on coal to Chicago is \$1.50. It would not be a hard matter for vessel owners having the tonnage to offer to secure \$1.75. This is the highest rate paid on coal from Oswego in many years.

I don't want you to think that this is an advertisement by any means, I don't get anything for it but would like you to say that Capt. John Johnson, retiring managing owner of Hand & Johnson's tug line, this week was agreeably surprised when the employees of the line presented to him a beautiful leather-covered couch. To a presentation speech by one of the men, Capt. Johnson—a man of very few words, but straight to the point—replied in a few well-selected words, thanking them heartily.

As regards a general cargo, or as is known in lake parlance, package freight, there is too much of it here for vessels to handle, therefore the railroad gets it at an increased rate. I learn that at Duluth and Milwaukee the Northern Steamship Co. has refused to make any more contracts for this season. It will have all it can do to move the freight it has already agreed to take before navigation closes. Under these circumstances it is not surprising that the railroads are disposed to raise rates and will undoubtedly do so after they have discussed the situation for next month.

Here is a news item which I have just picked up, and which RECORD readers may as well know about: There are at Three Rivers, Que., the first consignment of 1,000,000 tons of iron ore, which is to be shipped to Buffalo. The ore is owned by Rodford & Co., of Buffalo and Mexico. Isaac Rodford called on Capt. J. Gaskin, of Kingston, to secure boats for the transportation of the ore. I don't think that this Capt. Gaskin is any relation to the foreman of the Union Dry Dock Co. here, although the name being the same the question was brought up.

The Toronto Globe says the low water that prevails throughout the lakes is considered more seriously by vesselmen and wharfingers than was at first anticipated. When the dredging of the rapids and the canal along the St. Lawrence below Prescott was commenced the engineers claimed it would not affect the water mark, but some of those who navigate the lakes contend that the deepening and widening has increased the water flow enough to lower the lakes. Others believe all the dredging that could be done would not make any material difference. Should the water subside much farther it will prove a serious matter to some vessels entering harbors and dock slips.

FIFTEEN thousand sailors and fifteen hundred apprentices now comprise the full enlisted force of the Navy, when the law allows twenty-five hundred additional men and one thousand more boys. To secure the additional men recruiting stations are instructed to begin active work and enroll suitable men as fast as they can be passed. The Navy requires every man it can secure to man vessels now in commission, and those as well approaching completion. There is not, however, the same pressing need for apprentices owing to lack of quarters for them at the Newport and San Francisco training stations, where new barracks are in course of erection.

CHICAGO.

Special Correspondence to The Marine Record.

J. W. Westcott, of Detroit, has sold the schooner Shawnee to the Edward Hines Lumber Co. of this city for \$9,000. The latter concern recently bought the steamer Cormorant and the schooner Wall, all for use in the lumber carrying trade.

Heavy fruit shipments from the southwestern Michigan counties continue and the Graham & Morton line boats are loaded each trip. The west-bound boats carry good loads of fruit, while the east-bound boats carry more than the usual quantity of package freight.

In addition to a full capacity load of package freight for Lake Superior the City of Traverse, of the Lake Michigan and Lake Superior line, Friday, carried out 150 workmen for the "Soo." The workmen are to be employed on the waterworks at the "Soo" and on the new Algona Central Railroad.

The Phenix Steamer Co. was reorganized by the election of the following officers: President, Charles E. Kremer; vice president, F. T. Bently; secretary, W. J. Rardon; treasurer and manager, J. J. Rardon. Capt. James Davidson, of Bay City, retires from the company, having sold his interest.

The steamer W. C. Moore, which has covered the Chicago-Waukegan-Kenosha freight and passenger run this season under the management of Eugene McKernan of Chicago, has been sold to a Green Bay company to engage in the ore trade. She started for Green Bay Friday night. Mr. McKernan expects to get another boat on the run at once.

Capt. Calbick, who has returned from the survey on the steamer Peerless at Duluth, says the stanch old boat is in excellent condition. "Never have I seen a vessel in a better state of preservation," he said, "than the Peerless. Stories about her hull being rotten are way wide of the mark." Capt. Calbick represented the underwriters in the survey.

The steamer City of Chicago is being stripped for the winter at St. Joseph. The Graham & Morton Co. announce that a side-wheel steamer will be chartered for the run next year. Their business this year surpasses all previous seasons and another boat is needed. Owing to scarcity of material it will be impossible to build in time for the summer trade in 1900.

Work on the government breakwater at South Chicago is proceeding rapidly. Hausler & Lutz, the contractors, are building the cribs in the river at One Hundred street, and when finished will tow them into place in the lake. Thus far operations have been hampered considerably by the difficulty in securing material, though it is expected that there will be less trouble on this score as the season advances.

The movement to extend the time of service of the crews of the life-saving stations to ten months out of the year and to raise their pay \$10 a month, to a total of \$70 a month, is fast taking form. Prominent marine men of this city have already formulated a petition to Congress to help the surfmen and will enlist the aid of Mayor Harrison. Incidental to an advance in the wages and time of service of the surfmen on the chain of lakes, a similar advance will be asked for the Atlantic coast men.

The steamer E. W. Oglebay has just completed a remarkable round trip and made a new record for time in the ore business. In four and a half days the steamer ran from South Chicago piers to Ashland, loaded a cargo of iron ore and got back to the Calumet piers again. The time for loading was not very long, even for iron ore, but the average running time for the round trip, a distance of 1,552 miles, was at the rate of fifteen miles an hour. This includes the St. Mary's river and the time spent in the locks at the "Soo." The exact time was 108 hours and 27 minutes.

The L. M. & L. S. Transportation Co., owners of the steamer Peerless, has libeled the tug Industry, which had the steamer in tow, and the tug Buffalo, which had hold of the barge Stewart, and the tug Mystic, which was towing a raft and was mixed up in the sinking of the Peerless. The company claims \$21,000 damages from the tugs on the ground that they did not maintain proper lookouts, were not giving proper signals, and for risking an encounter with one another. The Industry and Buffalo belong to the tug trust and the Mystic to the Stevens Tug Co.

A waterway or canal to connect the Illinois river with Lake Michigan is now being surveyed under the direction of Major Marshall, Corps of Engineers, U. S. A. As the Chicago river is too narrow and crowded for additional traffic, the proposed route will start from some point near the Calumet river and strike the drainage canal near Sag Bridge, while another cut will connect this canal with the basin of the Illinois and Michigan canal at Lockport. The canal will be improved and enlarged as far as Lake Joliet, beyond which the route will follow the Des Plaines river and the Illinois river to the Mississippi. This proposed waterway is to be 160 feet wide and 8 to 10 feet deep.

It is always pleasant to learn of high-classed shipbuilding at lake ports, and especially so in the case of passenger boats. The tugs at Duluth evidently tried to see what the good old steamer Peerless was built of, and in doing so got her into a collision so that she had to be opened up for repairs. This gave a chance for experts to go thoroughly over the vessel and they declare that she is as good to-day as when she was launched. The Peerless was built under special inspection, the material and workmanship put into her was first-class and her owners have given her everything she

needed in the way of keep-up so that she is still one of the best, most comfortable and fortunate passenger boats on the lakes.

I met a prominent coal man this week and from the gist of his remarks gathered that there was barely enough soft coal on the docks at Milwaukee to supply the demand, while that from the interior of the state is supplied by all-rail, which, just now, is cheaper than the lake rate of \$1 per ton from Lake Erie ports. With regard to anthracite the situation is, if anything, more serious, as there is no way of getting the coal there, he said, except by lake. Up to September 1 there had been received 472,978 tons of anthracite, and to place the market in good shape about 480,000 tons more ought to be received between now and the close of navigation. This amount will be impossible to get forward by water, and what the result will be later remains to be seen. I shall, therefore, suggest that owners of vessels not requiring ballast should maintain a fair living rate of freight on coal.

All of the warehouses of the local boat lines are crowded to their utmost capacity nowadays with package freight, and every boat clearing is loaded. Shippers to the northern or across the lake points have discovered that whereas the rail lines permit freight to lie in their warehouses until they secure cars enough to move it regardless of the time necessary to do this, the boat lines are so situated that they must clean up their warehouses each day. Freight received by any of the boat lines for any point reached by them goes out on the first boat leaving for that port. With the rail lines short of cars, this feature of the boat lines is found to be of peculiar value to the shipper. Since the recent cold weather began, none of the boat lines has had enough passenger traffic to interfere with its freight trade, and despite the rough weather the steamers have made excellent time, and with very few exceptions have kept to their schedules.

The Chicago & Northwestern railway has cut a piece off Chicago river by constructing a dock in the stream at the ruins of the old air line elevator. Two pile drivers were put to work late Saturday night, and by 6 o'clock Monday evening the dock had been completed. The filling in is all that remains to be done to make solid land where there is now 16 feet of water. The section of the river thus taken in is triangular in shape. It has a face on the river front of over 100 feet. At the west end it is fully 35 feet wide. Its value to the railroad will be several hundred thousand dollars. There are many old river men who maintain that the move on the part of the road is a gigantic steal from the river, and a matter which should be taken up by the United States engineer. The day has gone by for these deliberate steals to be perpetrated by either railroad companies or other interests, and we are now looking for the greatest good to the greatest number.

In his monthly report to the War Department Major William L. Marshall, the engineer in charge of river and harbor improvements at Chicago, says the channel of the north branch of Chicago river is rapidly filling with the contents of the sewers. He says that in addition to the sewage large quantities of soil are being carried into the river by heavy rains. He also explains that the dredging above Fullerton avenue has been abandoned because hardpan was struck. It could not be removed by the dredging process in use, and under the contract the work ceased. The engineer adds that the channel is deep enough for present needs of navigation. Major Marshall reports good progress being made in the survey for improvements along the Illinois and Des Plaines river. One of the engineers attached to Major Marshall's staff will probably be sent to Manila for assignment to the staff of General Otis. That commander has asked the War Department for a number of engineers, and a circular letter has been sent to the chiefs of divisions directing them to recommend one man from each of the important stations in this country. Subsequently another circular urged special haste in designating men from Chicago and Detroit. It does not follow that these engineers will all go to the Philippines, but from the number recommended by their chief selections will be made to meet the requisition of General Otis.

"Regarding the accident to the steamer Douglass Houghton's rudder chains, which resulted in sending that vessel to the bottom of St. Mary's river, entailing a loss of \$1,000,000 on account of blockading commerce, bridge tender says as follows. Let me say there is one important fact that can be vouched for by at least nine-tenths of the captains in charge of lake vessels: That is, there is no provision in the inspection laws making it compulsory for steamboats to carry an extra wheel aft for steering purposes in case of an accident of that like the Houghton. It seems strange that an inspector, when examining a steamer, has to see that the name of the vessel is marked upon various articles, for instance, the axes a ship carries are marked, and were a ship to sink they would immediately go to the bottom with her. That shows the deficiency in the law. It compels marking an ax and leaves one of the main things which will prevent serious accident overlooked. I don't know if the Douglass Houghton had an extra wheel aft. The chances are that she had relieving tackles aft for the tiller, as is the case in most steamboats. But of what good are they when the rudder-chain is carried away? The remedy lies in an extra wheel aft, with tackle all ready. Then, if the rudder-chains give out, in three minutes, at the most, they can have a man steering by the after wheel. One hundred dollars would equip a steamboat with the wheel, and perhaps would be the cause of saving thousands of dollars' worth of property, and what should count more, human lives."

DULUTH-SUPERIOR.

Special Correspondence to The Marine Record.

James Pryor & Son have two dredges at work excavating for a new dock in East Houghton. A wharf of large capacity will be built along the entire water front, a distance of 405 feet. The Pryor wharf, in connection with the new quarter of a mile frontage of the copper range railway, will double Houghton's dock facilities.

Capt. Barker is one of our most active citizens and I now learn that he is to build four large scows this winter to assist in carrying out his government and private contracts for dredging, etc. Taking the entire plant into consideration, Capt. Barker has, perhaps, done more for the head of the lakes than any other one man located here.

From this end we learn that the affairs of the Great Lakes Towing Co., the tug trust, are waiting just at present, the efforts to incorporate the Toledo and the Milwaukee lines with the others having been suspended for the present. The purchasing committee has fixed a value on these boats, and the negotiations to close at the figures named are still pending. It is thought that the companies will be gathered into the fold of the trust before very long.

Capt. Robert Smith, of the excursion steamer Christopher Columbus, was home this week for the first time since the opening of the excursion season between Chicago and Milwaukee. He says the whaleback passenger boat did the best business this year in her history. She carried about 1,000 passengers daily on week days and on Sundays from 2,500 to 4,000. Capt. Smith says that Duluth will know the Christopher Columbus no more unless she happens to be sent here for some special purpose. The boat will winter at Manitowoc. Capt. Smith didn't say so but the Columbus is a Goodrich boat all the same.

Shipments of flour during the past week have been very slack, and as a result the warehouses of the mills were completely stocked and the mills were inactive as there was no storage to be obtained. This inactivity was due to the extremely low rates on flour as compared with that of other commodities, and vesselmen were not willing to take cargoes of flour when they could get ore, wheat and lumber. But the situation has improved. Cargoes were taken later at a rate of 3 cents per hundred or 6 cents per bushel, and this places the lake freights rates on flour on a more equal basis with other cargoes. Vessels have been offered to load next week and from now on it is expected that shipments will be very large. The shipments for the week were only 19,810 barrels, as compared with 35,753 barrels the preceding 7 days.

The government has taken up the matter of the complaints lodged against lumber firms on account of obstruction to navigation. The complaint of the vesselmen is that the long booms of rafts of logs being hauled in and across the harbor are a menace to navigation, particularly the boom sticks after the logs have been taken to the mills. They allow the boom sticks to drag for a great distance behind the tugs, sometimes nearly a quarter of a mile, and boats coming and going in the harbor have to wait until the sticks have been removed from across the channel. What the vessel men want is to have the lumberman to "double" the boom logs, thus making the raft shorter and also that they keep their proper place in the channel. The collision of the steamer Peerless is cited as an evidence.

DETROIT.

Special Correspondence to The Marine Record.

The Michigan Central car boats were inspected and pronounced to be in good condition this week by the Canadian Steamboat Inspector John Dodds.

The Hines Lumber Co. has purchased of J. W. Westcott his schooner Shawnee, to be used in carrying lumber. The consideration was \$9,000. This purchase, together with the steamer Cormorant and schooner Wall, will materially increase the fleet of the Chicago firm.

I learn that a complaint has been received by the Treasury Department at Washington from certain vesselmen to the effect that they experienced considerable difficulty and delay in securing clearance papers at the port of Sandusky, Ohio, late in the night. The matter is to be investigated.

The records at the custom house show that during the present season of navigation over 40 different vessels will change their hailing ports from Huron district to some other district of the Great Lakes. The purchase of the Thompson Towing Co.'s tugs by the trust company has had much to do with this condition of affairs.

John Stevenson, representing the new owners of the burned steamer Aurora, has awarded the contract for rebuilding and remodeling the vessel into a tow barge to Alex. Anderson, of Marine City. The contract calls for the completion of the work by April 1, 1900. About \$35,000 will be expended in the rebuild of what was once the best constructed wooden steamer on the lakes.

Talking to one of our owners here to-day he asked me who was the individual that placed an embargo on the port of Toledo and would not allow vessels to enter there. I felt called down because I didn't know that our old Toledo port had only 15 feet of water. There was no presidential proclamation that the port was unsafe, the RECORD had said nothing about it, nor had any other authority, so he said that he would telegraph.

The steamer Wallula, of the Wilson Line, was attached by Sheriff Mains, on Tuesday, in the case of Mrs. Ralph Hackett against the schooner Yukon. The Yukon, belonging to the Wilson Line, collided with the tug Torrent in the Flats canal, and Captain Hackett was killed. Mrs. Canarie, widow of another man killed in the collision, has obtained a judgment, and there is another suit for damages in a similar case. The Wilson Line has always been one of the best out of Cleveland and anything that is right the manager of the line, Capt. Thos. Wilson will always do irrespective of dollars and cents, yet, I have heard that Capt. Wilson can't be imposed upon.

General Manager Carter of the D. & C. line of steamers has computed the number of miles run so far this season by the steamers of the line. Each of the Cleveland boats has run a distance equal to the circumference of the globe; or in exact number of miles, 24,840; each of the Machinac boats has already run 32,680 miles. The total number of miles which all the steamers of the line will have traversed by the close of the present season will be about 133,000, or more than five times around the world. The D. & C. steamers commenced running this year on March 25, and the prospects are that the weather will admit of their running until late in the fall.

Congressman Corliss' suggestion to Secretary of War Root regarding the proposed dam in Niagara river, has aroused any amount of discussion among vesselmen along the river front. Some express the belief voiced by the congressman that even a slight damming of the waters at the foot of Lake Erie would act beneficially upon the depths of water in the channel. However, the majority, possibly, are inclined to ridicule the idea that a dam below Buffalo will in any way influence the depth of water at the Lime Kiln Crossing, for instance, said one owner of vessel property, "I know what they will do before they get through. And that is put Buffalo half under water. First we know, we'll have plenty of water all right; pretty near enough to sail over Buffalo, perhaps by the time the water is raised a foot in the Detroit river." It occurred to me during the interview that they ought to consider the bottom more than the top. The slope of the bottom is perhaps the chief question after all, except on Lake Superior.

I had to listen to a hard luck story from an old lake sailor this week. The particular growl was about lumber barges loading until their decks were awash, and he insisted that the crews should step ashore from such craft. I told him there was no reason why they should not if the vessel was unseaworthy, or rather lakeworthy, but he thought signing articles was a good deal like a death warrant, however, in his own word: "Another thing the steamboat inspectors are very particular about a steamboat. They go down, look them over to see all about life preservers, oars and axes, life lines on the boats, fire buckets and things like that, but no account is taken of the tow barges. Our lives are just as precious to us as theirs is to them. I know of a tow barge running all last summer with only one oar aboard. Not one barge in twenty has life preservers; and very often a man falls overboard and before you get the yawl down he is gone. This business needs looking into by some one, and if the MARINE RECORD would only take it up our lives would be safer, and if you would print this two or three times this fall lots of people would take interest enough to look up the barges and see how they are equipped. No boat will go out overloaded in a gale but we are often caught out and then if she lives all right, if she don't down we go." Well! the sailor was considerably in earnest over his tale of woe, and I think barge owners should see that there was a life preserver aboard of their craft, also that more than one oar be carried if only for rowing purposes when sculling was found to be impracticable.

CLEVELAND.

Special Correspondence to The Marine Record.

The J. H. Wade thought she owned the river on Tuesday and smashed into the steamer State of New York in trying to enter the harbor.

All the tonnage that shippers wanted this week was chartered at 50 cents for the head of the lakes. Ore rates are down to \$1.85 cents.

Capt. John Mitchell sold the steamer W. F. Sauber to W. H. Becker and Martin Mullen, of this city for \$100,000. She will be turned over to her new owners October 20th.

The little trading schooner Pontiac, Capt. Baker, drifted ashore at Lorain on Tuesday and became a total loss. She was loaded with produce and trading stuff for the Cleveland market.

Now comes along the steamer Pathfinder with dry dock repairs through the captain trying to knock down a dock at Ashtabula. About a year's salary will be the cost of his carelessness.

A dispatch from Pelee Island states that the old steamer S. Neff was burned there on Tuesday morning and is a total loss. She was owned by Capt. John Corrigan, and carried gravel between the islands and Cleveland.

Mr. E. Platt Stratton, chief engineer surveyor for the American Bureau of Shipping, and the classification society universally known as the "Record of American and Foreign Shipping," will visit Cleveland next week and call upon the most prominent shipowners, also the builders of lake craft.

Again that land surveyor at Lorain and Toledo attached to the U. S. Engineer Department of this port is in evidence. This time he will permit vessels drawing 15 feet of water to enter Toledo. The United States Navy, commanded by Admiral Dewey will, perhaps, support the contentions of this novice.

It seems that the Leader of this city, as well as the Plain Dealer, is being edited, in its marine columns, from the same party. Twice this week have their marine columns been the same as regards telegraphic and local news. I draw the line, though, on the Leader man's story about the marine engineers' strike.

Mr. George Uhler is to be credited with advancing the wages of marine engineers and no doubt will be re-elected as president of the association of the Marine Engineers' Society. The Lake Carriers as well as the old Cleveland Vessel Owners' Association always raised the wage in the fall and therefore Mr. Uhler's appeal was opportune.

Col. Smith, Corps of Engineers U. S. A., will remove all obstructions in entering this port or in his district. One of them is the schooner Benson, which went down off Sandusky June 20th. It is desired to get this out of the way, as it has been proving a serious obstruction and one fraught with a good deal of danger. The other one is the schooner H. G. Cleveland, which foundered off Rocky River August 12. The contractors will be allowed to choose the manner in which these wrecked schooners shall be removed.

The Bessemer Steamship Co. has been granted permission by the Commissioner of Navigation to change the name of the steamer Globe to James B. Eads. It is the custom of the Bessemer Steamship Co. to name its boats after prominent iron men, inventors and others. James B. Eads was an eminent civil engineer, who acquired international fame from the construction of the St. Louis bridge across the Mississippi river, and later through the construction of the piers at the mouth of the Mississippi river, which were the first to ever hold the Mississippi bar to a regular deep draft.

Talking about vessel transfers of ownership a broker stated a day or two ago that this is the greatest season for selling boats that has been seen for a good while. Usually it is seen that vessels are sold almost entirely during the winter, but there have been sales and transfers all summer, some of the largest boats being disposed of. Some say that the shippers have found that in order to move their cargoes without heavy loss they must own their own vessels, and they have started in to buy a fleet. This accounts for a good many sales. Then, the season is a prosperous one, and the investors naturally look to the lakes to place their money. Both influences have made the sale of boats heavy.

The following data, covering a period of 28 years, have been compiled from the Weather Bureau records at Cleveland for the month of October for 28 years. Temperature—Mean or normal temperature, 53°; the warmest month was that of 1879, with an average of 59°; the coldest month was that of 1895, with an average of 47°; the highest temperature was 87° on October 7, 1879. The lowest temperature was 24° on October 26, 1887. Average date on which the first "killing" frost occurred in autumn, October 11; average date on which the last "killing" frost occurred in spring, May 1st. The greatest amount of snowfall recorded in any 24 consecutive hours (record extending to winter of 1884-85 only) was 1.5 inches on October 31, 1890.

The Cleveland & Buffalo Transit Co. announce that the boat line this year would close as usual at the first of December. The general manager says that the weather has never affected their boats in the least, and the little breezes they have been having of late have not daunted their masters in the least. He says that a good many people have asked about the boats closing the season and makes this announcement in answer to all of them. Mr. Newman, who is superintendent of the company, is by no means a believer in hard weather after the sun crosses the line. Equinoxes are all right and autumn breezes may predominate in this latitude, but the fine large passenger steamers will run between this port and Buffalo until the Ice King says "halt."

SHIPPING AND MARINE JUDICIAL DECISIONS.

(COLLABORATED SPECIALLY FOR THE MARINE RECORD.)

Seamen—Personal Injuries—Liability of Owner of Ship.—The master of a ship and a seaman are fellow servants in all matters pertaining to the navigation of the ship while on a voyage from one port to another, and each assumes the risk of the other's negligence in the discharge of the duties incident to their common employment. Olson vs. Oregon Coal & Navigation Co., 96 Fed. Rep. (U. S.) 109.

Negligence of Master.—The owners of a ship are not liable in damages for the personal injury of a seaman received while on a voyage by falling or being thrown by the rolling of the vessel, down a hatchway which had been left open through the negligence of the master or other officer, where a proper hatch was provided, and no claim is made of negligence in the selection of the officers. Olson vs. Oregon Coal & Navigation Co., 96 Fed. Rep. (U. S.) 109.

All the up-country is interested in the recommendation that the Niagara river be dammed. The idea is to raise the lake level in the interest of navigation. The cost will be \$1,000,000. As Chicago is mostly interested, of course the great city of the west would furnish the whole amount necessary to defray the expenses.—Buffalo Evening News.

CHICAGO AND RETURN VIA THE MISSISSIPPI AND HUDSON RIVERS.

Pointing out, as the RECORD has done for several issues past, the suicidal policy of "tapping the lakes," we print the following pertinent communication from Geo. W. Brooks, Peoria, Ill., to the Waterways Journal, St. Louis:

"It has been definitely determined that craft of considerable size can pass from the Illinois river and Michigan canal through the Illinois river into the Mississippi river. This fact of itself makes the Illinois river one among the important commercial factors of the American Continent, and time will some day in the near future reveal and disclose the method of utilizing this beautiful river which Nature intended for our benefit. It is possible, but not very probable, that this river was intended as a channel through which the great metropolis of Chicago should discharge and empty her filth and refuse; but to the citizens along the Illinois River Valley it should appear differently.

"Think of it as an undisputed fact, that you could leave Chicago by way of the Illinois and Michigan canal, which

southwesterly direction and falls into the Mississippi river near Grafton, Ill. The Des Plaines river, a northern tributary of the Illinois river, rises to the west of Lake Michigan and, flowing south, joins the Kankakee river from the east and forms the Illinois river. The Vermillion river, of Illinois, heading with the Vermillion branch of the Wabash river, but flowing northwest by comparative course 60 miles, falls into the Illinois river at Vermillion Rapids. The Kankakee river, the great southeast source of the Illinois river, rises with the headwaters of St. Joseph river, of Michigan, flows west, and unites with the Des Plaines river.

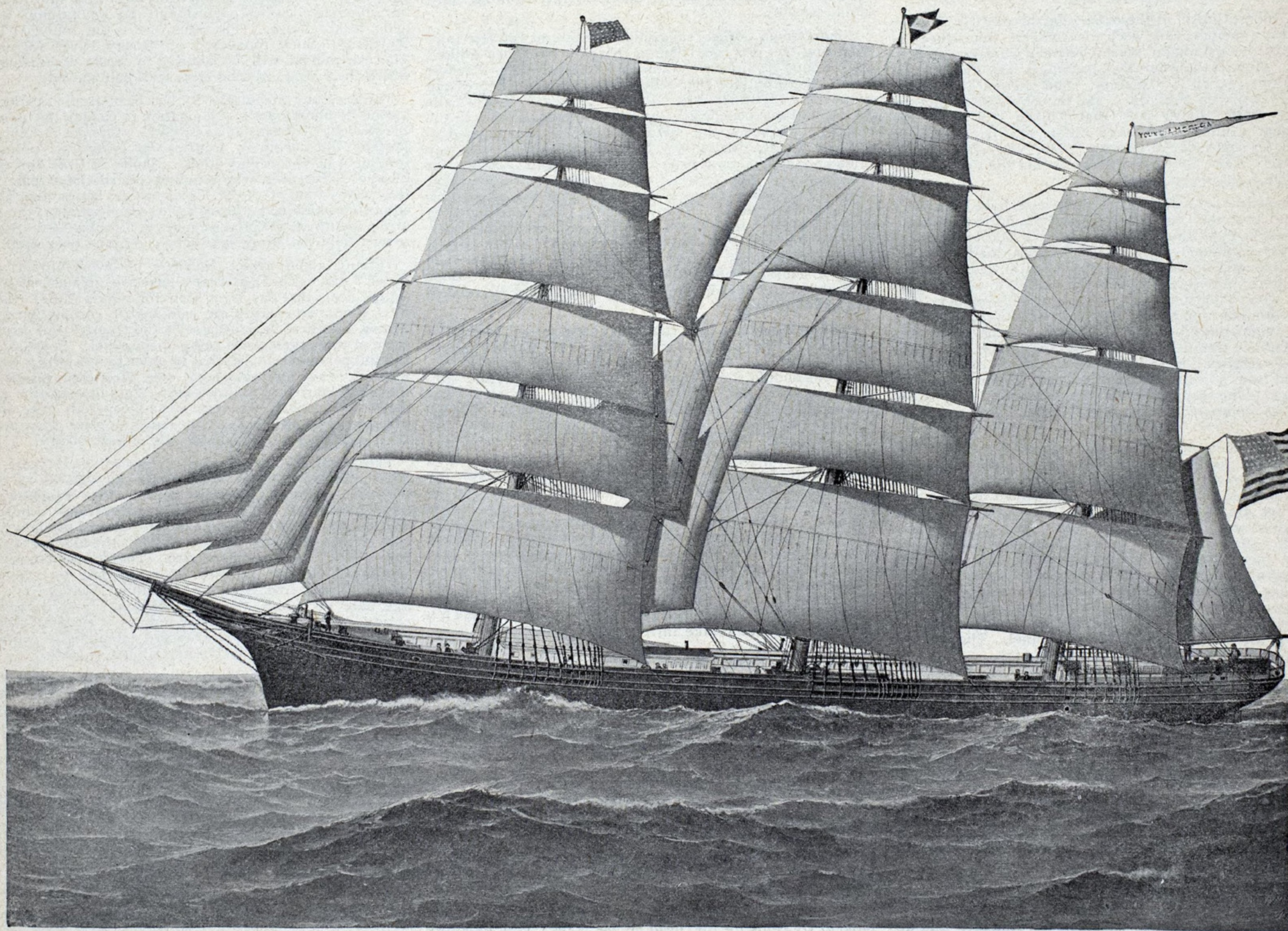
"History and geography disclose the foregoing facts, and, notwithstanding the many tributaries contributing their waters to the Illinois river, there is not a navigable channel from the Chicago drainage canal to La Salle, Ill. Why do the people want the dams removed from the navigable part of the river before the upper portion is made navigable?

"During times of low water much inconvenience was felt in the matter of delays in shipping to market the products of the Illinois river valley. This state of facts led the people of the river valley, with many other interested parties,

tioners was granted and two more dams were constructed and are known as the Government dams, at La Grange and Kampsville, Ill., and by this means navigation as far up the river as La Salle at all times during the navigation season was assured. 'Let us retain the dams until something better is demonstrated!' should at all times be the motto of the residents of the Illinois River Valley when it is proposed to remove the dams and substitute an uncertainty.

"The people take it for granted that a drainage canal simply drains a portion of country, failing to realize that this is a sewage canal as well. Protest rather than submit to the uncertain Chicago drainage canal system for the improvement of navigation in the Illinois river. You should remember that there is a vast difference between drainage from the farm lands and sewage from the great city of Chicago. The filth and offal of Chicago is daily increasing in volume, and should the city keep on growing in population for the next 20 years as it has for the past 15 years, and all the accumulating filth be ejected from the city through this canal, the Illinois river would be converted to a use differing from that anticipated, from the mouth of the river.

"Think of these matters before it is forever too late."



TYPE OF THE AMERICAN-BUILT CLIPPER SHIP.

(By courtesy of the American Shipbuilder, New York.)

runs from Chicago to La Salle, Ill., the beginning of the navigable part of the river; entering the Illinois and Mississippi river, thence through the Gulf of Mexico to the Atlantic ocean; might arrive at New York, thence by way of the Hudson river enter the Erie canal at Albany, N. Y., and from thence to Buffalo, there entering the first of the chain of Great Lakes, and return to the place from whence you started. There is no place upon the face of the great world where nature has interposed such a profound advantage, and dictated to human ingenuity the possibilities of commercial relations with the world, as this, except the sources of the Orinoco and Rio Negro in South America, where natural facilities to internal communication by water are equally advantageous. Nature did not develop the facilities and resources of relationship with the world, but has left the opportunities for human genius and science to develop as civilization moves westward. Wide from the mark for which nature intended, the grand Illinois river is being utilized and appropriated as advocated by the promoters of the Chicago drainage canal. The source of the Illinois river is at the southerly end of Lake Michigan, and from thence it takes a

to make a move toward substantial improvements for purposes of commerce during all of the navigation season. The indomitable energy and will of the people soon conceived the idea of building and erecting dams at certain places in the river to produce what is known as slackwater navigation. They enlisted the aid of the State of Illinois in making appropriations for the construction of the dams as proposed. In due time the State of Illinois, by her law-making power, saw the propriety and great benefit and advantage the dams would be for navigation purposes, and promptly and generously made appropriations for carrying on the good work. Joy was in many hearts in the contemplation of such a vastly beneficial enterprise, and great interest was shown in the advancement of the undertaking. The dams were finally completed, and their usefulness in making the river easily navigable was fully realized. The State of Illinois having built two dams, one at Henry and the other at Copperas Creek, Ill., that were so successfully operated in the interest of navigation, a petition was presented to the General Government through Congress, asking the aid of the United States in the construction of two more dams. The prayer of the peti-

EASTERN FREIGHTS.

Messrs. Funch, Edye & Co., New York, in their regular weekly freight report to the RECORD state as follows:

Since our last report but little change has taken place in our markets; in a few instances slightly higher rates have been secured by steamers chartered for full cargoes of grain, and in position not to load before the very last days of this month or early next, but near-by tonnage has been obliged to accept lower rates than those current last week. A fair enquiry exists for vessels to load after the middle of October and during the balance of the winter months at full rates. Cotton and timber requirements have been satisfied for the present up to the end of October, although a change for the better may be looked for at any moment when prices for the former staple reach a parity with views of foreign buyers. The large number of vessels recently taken up by time charters appears to have pretty well filled all requirements in this department.

Our market for sail tonnage maintains its firm position, though business has not been very lively during the week past.

A STEEL AQUEDUCT SHIP CANAL.

(ILLUSTRATED.)

The accompanying illustration shows a view of the American steel aqueduct ship canal, invented and patented by Alexander Hogeland, Louisville, Ky.

The inventor would apply his project to a Panama, Nicaragua or any similar canal, even suggesting that such an aqueduct would be a commercial success if built between the Pacific coast and Duluth, Minn., and, in so far as the Erie or Welland canals are concerned, the steel and concrete form would prove less costly, more durable, and give more general satisfaction than the present style of work.

In a recent letter to the president of the United States Mr. Hogeland said, in part:

"Capt. Eads, builder of the St. Louis bridge, and founder of the Mississippi jetties, is authority for proposing a ship railway across the isthmus; that of itself is sufficient evidence of the compactness of the soil for an aqueduct maritime highway. The weight of the aqueduct is distributed equally over a concrete roadway or foundation, while the walls of a canal at many points will demand miles of costly stone walls to prevent slides and millions of money will be squandered in dredging machinery used in the process of digging.

"I file herewith testimonials from mechanical engineers, bridge builders, and from makers of concrete highways, certifying to the entire practicability of the aqueduct plan of canal, and placing its cost at not over a half-million dollars per mile. I claim that an aqueduct will not only rival a dug canal in convenience, and obviate the use of all dredging machinery, but it can be built in three year's time, and perhaps less, and at one-half the cost of either the Panama or Nicaragua canals. The foundation of the aqueduct will be above sea level and tide-water. The plan of an aqueduct brings its floors thirty feet above the bottom of a canal. This increased height of water in an aqueduct will save the building of two locks at the foot-hills on both the Atlantic and Pacific Oceans. There will necessarily be a saving of thirty feet in the expensive rock excavations on the grades of the foot-hills. Steel and iron bridges will carry the aqueduct over water courses where the excessive rainfall renders unsafe the construction of and dependence on dams over streams along the route for a canal, that are frequently torrents one day and dry the next. When important highways are encountered on the route, tunnels can be laid under the aqueduct.

"We have listened for 4,000 years to the word 'aqueduct' supplying the cities of the world with water for domestic purposes, baths, mill-power, mining and irrigation. The verdict of engineers is that these were a success. We now say build a roadway of concrete or asphalt 100 feet wide, more or less, throw up on each side walls of steel or concrete or combine both. Fill with water from reservoirs like that connected with the Croton Water Works at New York, Fairmount at Philadelphia, and numerous other places."

BUFFALO HARBOR WORK.

Following is a copy of a letter sent by Major Thomas W. Symons, Corps of Engineers, U. S. A., to owners of lake craft:

"The government of the United States has entered, through its contractors, upon the construction of the north breakwater. The southerly end of this breakwater is situated at a distance about half way from the end of the south pier to the breakwater light, and to the north of the main entrance channel from the lake to the Buffalo river. This north breakwater extends northerly about parallel with the old breakwater.

"In the construction of this north breakwater it is necessary to anchor dredges for excavating the soft bottom, and it will be necessary to sink timber cribs upon a prepared foundation.

"In doing all this work it is absolutely necessary that the dredges and the cribs in process of sinking shall not be disturbed by excessive or sudden wave action, and this letter is written to you to invite your attention to the fact that all tugs and boats of all kinds must, in passing the site of this work whenever operations are going on, reduce speed so as to insure that no damaging wave action will occur.

"Considerable damage has already been done by boats passing the site of the work and disregarding the warning whistles of the dredges at work there, and you are respectfully warned that you will be held responsible for all damages done by any boat or boats under your charge, which may run by at a sufficient rate of speed to cause disastrous wave action."

THE MAYFLOWER AND THE OCEANIC.

Those persons who are on the look-out for coincidences may find one in the sailing of the Mayflower with the Pilgrim Fathers, and the sailing of the Oceanic on her first voyage.

The Mayflower sailed from Plymouth, for the land of the West, on Wednesday, September 6, 1620.

The new Oceanic sailed from Liverpool, for New York, on Wednesday, September 6, 1899.

It will be of interest also to compare the size of the Mayflower with that of the Oceanic.

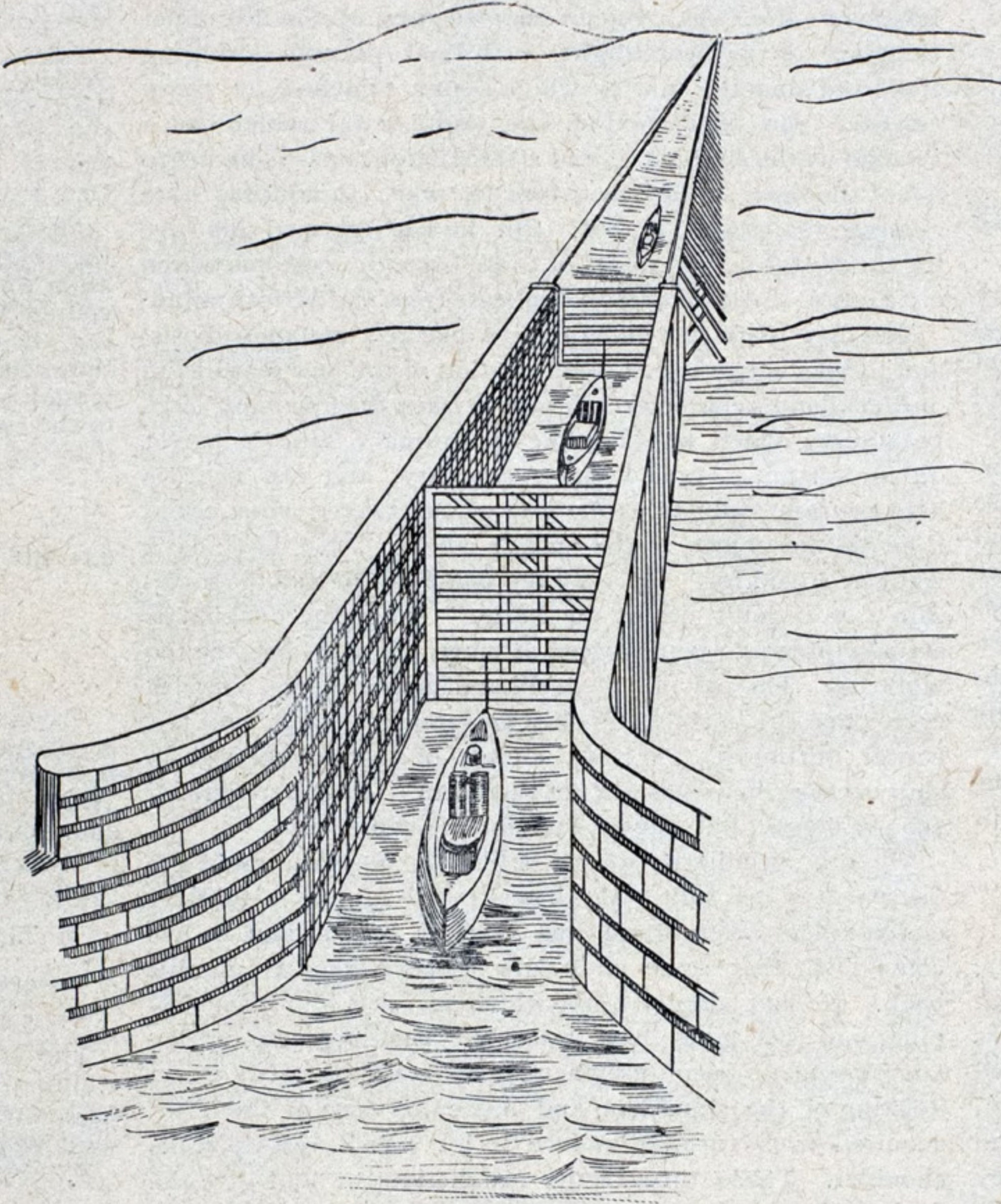
The Mayflower was said to be 180 tons burthen.

The Oceanic is 17,274 tons gross measurement.

The former carried 100 passengers.

The latter will carry 1,575 passengers and 450 crew.

A male child, born on board the Mayflower, was christened 'Oceanus.'



A resident in Belfast, who was presented with a daughter on January 14, 1899, the day of the launch of the Oceanic, christened his child with the name of the new ship.

WIRELESS TELEGRAPHY.

Signor Marconi has crossed the Atlantic to demonstrate his system of wireless telegraphy to the signal corps of the United States army. He will superintend the announcement of the arrival of the Olympia with Admiral Dewey on board. A vessel equipped with his apparatus will cruise out in the Atlantic off Sandy Hook, and when the Admiral's vessel is sighted the ether will carry the tidings to New York before the vessel is visible from any point on shore. The same system will be used to report the international yacht races between the Columbia and the Shamrock. His discovery opens a new and undreamed-of era in telegraphy.

THE rate of depreciation of warships has long been a mooted question, but it has remained for the Japanese naval authorities to place themselves on record with a definite statement of what they regard as a reasonable figure. In estimates for repairs and rebuilding the Japanese experts have given 3.9 per cent. on cost as the rate of annual depreciation for armored vessels and 5.4 per cent. for unarmored craft. The figure for the various types of torpedo craft is given as 6.5 per cent. per annum.

TEMPERATURE OF THE SUN.

The temperature of the sun has been held of late years to be probably between 8,000 and 9,000 degrees centigrade, this being the result obtained from a careful investigation made by Messrs. Wilson and Gray, in 1893. Recently, Professor Wilson has conducted what may be considered in supplemental investigation of "Radiation from a Perfect Radiator," an account of which is given in the Astrophysical Journal, which has led him to conclude that his former figures were too low, and he now gives 11,300 degrees centigrade, instead of 8,700, as more probably the sun's "effective temperature."

This temperature can be ascertained, of course, only from a study of the efficiency of the sun's heat at our distance from it of about 92,700,000 miles, or, in other words, from the power of the sun's heat radiation at the earth's surface, and in order to work out the problem from this easily-ascertained datum it is necessary to know the law of heat radiation from a "perfect radiator," which the sun is assumed to be. It may easily be found by experiment that the rapidity with which a hot body cools, or in scientific phraseology, radiates its heat, varies greatly with the temperature of the body. A very hot body cools much faster than one at a lower temperature. But only after a long series of

carefully conducted experiments has the law of this variation been made out, at least approximately. Wilson and Gray found that the radiation is very nearly proportional to the fourth power of the temperature, a conclusion which will be Greek to the unscientific reader, but which can be illustrated thus: If a body at a certain temperature, say 100 degrees centigrade, throws to a certain distance from it a certain amount of warmth—which may be measured by means of some one of the delicate heat detectors now in use—the same body raised to a temperature of 200 degrees will affect the instrument, not twice as much, but sixteen times as much, sixteen being the fourth power of two. Or to give another illustration, if the sun's temperature were to be doubled the potency of the heat rays upon the earth would be sixteen times as great as it now is, and were it to be trebled the heat which we should then receive from the sun would be 81 times as great as now.

Ignorance of this law was one reason why the earlier investigators of the sun's temperature made it out to be vastly higher than it probably is. Father Secchi estimated it in millions of degrees, and other scientists made it tens of thousands of degrees.

The method pursued by Wilson and Gray in the investigation was, first to study the law of radiation from a platinum strip, which was raised to any desired temperature by an electric current, and the radiation from which then balanced the radiation coming from the sun, the balancing instrument being a duplex Boys' radio-micrometer, especially designed for this work." It was assumed that the radiation from this strip was only thirty-five hundredths of that from a "perfect radiator." Professor Wilson now thinks this to have been an error—that the radiation was nearly perfect. Hence, his correction of the result then obtained, as above stated—11,300 degrees, as the sun's temperature, instead of 8,700 degrees.

They were inspecting the Texas. "The place we have just left," explained her escort, as they went below, "is called the gun deck." "I see," she exclaimed brightly. "And I suppose that place down there where they're raking the fires is called the poker deck."—Philadelphia Record.

There are indications that at the next session of Congress an effort will be made by Senators and Representatives from the states bordering on the Great Lakes to have a joint Canadian and American commission appointed to examine into the question of maintaining the levels of the lakes in the interest of navigation. The Lake Carriers' Association has recently been making strong efforts to awaken public interest in the matter. The State Department and the War Department already have had the matter called to their attention and some action of a favorable character has been taken by the latter. The agitation grows out of the various movements to cut canals at several points along the lakes.—Sandusky Register.



ESTABLISHED 1878.

Published Every Thursday by

THE MARINE RECORD PUBLISHING CO.,
Incorporated.

C. E. RUSKIN, - - - - - Manager.
CAPT. JOHN SWAINSON, - - - - - Editor.
CLEVELAND, CHICAGO,
Western Reserve Building. Royal Insurance Building.

SUBSCRIPTION.

One Copy, one year, postage paid, - - - \$2.00
One Copy, one year, to foreign countries, - - - \$3.00
Invariably in advance.

ADVERTISING.

Rates given on application.

All communications should be addressed to the Cleveland office
THE MARINE RECORD PUBLISHING CO.,
Western Reserve Building, Cleveland, O.

Entered at Cleveland Postoffice as second-class mail matter.

CLEVELAND, O., SEPTEMBER 28, 1899.

FROM LAKE SUPERIOR TO LIVERPOOL.

The completion of the Soulages canal now makes it possible for vessels of 14 feet draught to load at Chicago and discharge their cargo at Liverpool. The Chicago Record of Saturday last referred to the opening of the canal and stated it was now in order for some one to establish a line of steamships between these two points. Whatever the Chicagoans may do in this respect the Canadian Government should lose no time in chartering the largest ocean vessel that the canal will accommodate, despatching it to Port Arthur and there loading it with a cargo of wheat for Liverpool. The arrival in Liverpool of a steamship with 2,500 tons of wheat, laden in the heart of North America, would call immediate attention to our new canal system, and would advertise its merits as nothing else could do. There is time to have this proposal carried out this fall. During winter the shipping firms of two continents would have time to sleep over the possibilities of Canada's great canal system.—Toronto World.

ALUMINUM FOR SHIPBUILDING.

The use of aluminum in shipbuilding is growing rapidly, on account of the almost inestimable advantage of its great saving in weight. Four or five years ago a small canoe was made on the Thames of two sheets of aluminum, stamped and riveted together. In 1892 Messrs. Escher, Wyss & Co., of Zurich, constructed a small launch entirely of aluminum driven by a naphtha motor, and in the following year they built for Mr. Nobel another larger vessel which has been in use ever since, and is now on one of the Swedish lakes. During 1894 and 1895 the author had a similar vessel on the Thames, between Windsor and Maidenhead. A much more ambitious attempt was made by Messrs. Yarrow in 1894. By request of the French Government they built of aluminum the whole of a second-class torpedo boat, 60 feet long by 9 feet 3 inches beam. This boat weighed in full working order but exclusive of armament, only 9½ tons, and attained, during a run of two hours, carrying a load of 3 tons and with engines indicating about 300 horse-power, a mean speed of 20½ knots—an advance of 3½ knots over all previous records.

Several yachts were also constructed at the same time, but they do not seem to have been a real and permanent success, owing probably to the adoption of an unsuitable alloy. As pure aluminum was not strong enough alone, it was thought better to use an alloy containing about 6 per cent. of copper in the construction of some of these boats. This alloy possesses a tensile strength of 14 tons per square inch; but, as already stated, this material is absolutely untrustworthy in sea water, owing to the rapid corrosive action set up between its two ingredients. Moreover, although nobody would dream of employing any other metal than copper for plating sea-going vessels unless it were afterwards painted, aluminum has always been used bare, which the author con-

siders a mistake. If the aluminum had been protected from direct contact with the water, it would have lasted much better.

Unfortunately, this comparative failure has materially discouraged the adoption of aluminum in shipbuilding, and although it is now well recognized that the pure metal, and several of its alloys which do not contain copper, stand the action of salt water better than iron or steel, some time is likely to elapse before these premature tests are forgotten. Eventually, however, when further experiments have been carried out, there is no reason why a suitable alloy should not be adopted which, when properly used and protected from direct contact with sea water, would resist corrosion as effectually as the majority of materials now employed in shipbuilding. These remarks refer only to the keel and other parts of the vessel below water, and chiefly to such craft as are to navigate the open seas.—E. Ristori in Cassier's Magazine for October.

THE MISSISSIPPI DECKHAND.

One who makes a trip up the river and watches the antics of the negroes and listens to their weird songs and tales, will not agree with the iconoclast who says that all the beauties and the picturesque features have faded out of the steamboatman's life. As a line of negroes goes up the hill under the glare of the searchlight, with their peculiar swinging tread and sing the music, which seems somehow to be an essential part of the action, the sight is one which has a strange wildness about it and a fascination, too. The negro is not the same as he was before the war. Conditions have changed too much for that. But he has retained his love for the fantastic and most of those barbaric customs which civilization seems unable to eradicate from the African mind.

The first mate has undergone a marked metamorphosis and to his change is due some portion of the new features in the deckhand's character. Time was when the first mate had a vocabulary which would make an ordinary sailor's parrot die for shame. He had this vocabulary, and the negroes held the same opinion as the one who answered when asked if he did not object to the mate's abuse: "No boss; dat's whut he's paid for. He's got ter make out he's doin' somethin', an it don't do us no harm." Now the deckhands actually object to being sworn at when the oaths become too vigorous. The pay of the deckhand is usually \$60 a month even when the business is only moderately heavy, and last winter, during the big rush, a crew of negroes refused to ship because the wages did not suit them. They were offered \$90 per month, but wanted \$100 for the trip.

The first peculiarity which strikes the observer about the deckhand is his walk. He has climbed up the steep river embankment when there was mud all over it, and he has come down that same slide with a heavy weight upon his back. He had adopted a step which prevents him from slipping, and this gives him a peculiar shuffling step, unlike any movement seen elsewhere. He combines with this a hoisting of the shoulders, and a peculiar turn of the head, acquired from turning his face to let a sack rest upon his shoulder. These three traits are distinctive and give the deckhand a strange appearance upon the levee, or anywhere off a boat or away from the river.

As he works going up the inclines or along the gangplank, precariously resting upon a levee's crest, he uses a rhythmic sort of chant which fit in with his music. Always the same class of songs are sung. Usually there are no words, but some leader chants and the others voice the chorus as they bend to their tasks. There are sack songs and barrel songs, and music for the cotton bale, and the ordinary package. The music varies with the task, as the movements of the negroes' bodies varies. The cotton song, as the bale is lifted forward and allowed to drop, has a catchy swing to it. Down go the sharp hooks and the bale starts up to fall with a quick thud. So does the music. The other airs, like all negro music, are harmonious, not melodious, which are timid to the labor.

The crap game can be seen in its full glory only when the deckhand plays it upon the boat's deck. From the foot of President's Island to the city, no stops are made, and a like condition prevails in regard to boats from the upper river. This is called the crap limit. The negroes are paid off before they reach the city. As soon as the pay is received the negroes gather and begin to shoot craps, and the cries for "Big Dick" and "Little Joe" and "Ada" are heard until the boat has landed. When it does some few negroes generally possess the money paid to all.—Ex.

SUN'S AMPLITUDES.

The following approximate amplitudes of the Sun's rising will be given each week in this column during the season of navigation. A second bearing may be taken by compass at sunset, by reversing the east bearing given for the nearest latitude, as the change in declination for a few hours makes but a slight difference in the true bearing of the Sun's setting. The bearing may be taken when the Sun's center is on the horizon, rising or setting. The three elements which may be obtained by taking these amplitudes are the quantities known as local attraction, variation and deviation.

LAKE ERIE AND S. END LAKE MICHIGAN, LAT. 42° N.
Sunrise. Amplitudes. Bearing P'ts. Bearing Comp.
Sept. 28.....E. 2° S. = S. 7½ E. = E. ¼ S.
Oct. 1.....E. 2° S. = S. 7½ E. = E. ¼ S.
Oct. 3.....E. 2° S. = S. 7½ E. = E. ¼ S.
Oct. 5.....E. 3° S. = S. 7¾ E. = E. ¼ S.

LAKE ONTARIO, S. END HURON AND CENTRAL PORTION
LAKE MICHIGAN, LAT. 44° N.
Sunrise. Amplitudes. Bearing P'ts. Bearing Comp.
Sept. 28.....E. 4° S. = S. 7½ E. = E. ¾ S.
Oct. 1.....E. 4° S. = S. 7½ E. = E. ¾ S.
Oct. 3.....E. 4° S. = S. 7½ E. = E. ¾ S.
Oct. 5.....E. 4° S. = S. 7½ E. = E. ¾ S.

N. END LAKES HURON AND MICHIGAN, LAT. 46° N.
Sunrise. Amplitudes. Bearing P'ts. Bearing Comp.
Sept. 28.....E. 5° S. = S. 7½ E. = E. ½ S.
Oct. 1.....E. 5° S. = S. 7½ E. = E. ½ S.
Oct. 3.....E. 5° S. = S. 7½ E. = E. ½ S.
Oct. 5.....E. 6° S. = S. 7½ E. = E. ½ S.

LAKE SUPERIOR, LAT. 48° N.
Sunrise. Amplitudes. Bearing P'ts. Bearing Comp.
Sept. 28.....E. 6° S. = S. 7½ E. = E. ½ S.
Oct. 1.....E. 6° S. = S. 7½ E. = E. ½ S.
Oct. 3.....E. 7° S. = S. 7½ E. = E. ½ S.
Oct. 5.....E. 7° S. = S. 7¾ E. = E. ½ S.

With a compass correct magnetic, the difference between the observed and true bearing or amplitude will be the variation for the locality. Should there be any deviation on the course the vessel is heading at the time of taking the bearing, the difference between the observed and the true amplitude after the variation is applied will be the amount of deviation on that course. If the correct magnetic bearing is to the right of the compass bearing, the deviation is easterly, if to the left, the deviation is westerly.

NOTICE TO MARINERS.

UNITED STATES OF AMERICA—NORTHERN LAKES AND RIVERS—MICHIGAN.

TREASURY DEPARTMENT,
OFFICE OF THE LIGHT-HOUSE BOARD,
WASHINGTON, D. C., Sept. 20, 1899.

TAWAS LIGHT STATION.—Notice is hereby given that on or about September 28, 1899, a 10-inch steam whistle will be established at this station, near the southwesterly end of Tawas Point, easterly side of Tawas Bay, northwesterly shore of Saginaw Bay, Lake Huron, to sound, during thick or foggy weather, blasts of 5 seconds' duration, separated by alternate silent intervals of 15 and 35 seconds, thus:

Blast	Silent interval	Blast	Silent interval
5 sec.	15 sec.	5 sec.	35 sec.

The fog signal building is a square brick house, with chimney rising from the center, painted light buff with red roof, and stands about ¾ mile southwesterly from the light tower.

By order of the Light-House Board:

FRANCIS J. HIGGINSON,
Rear-Admiral, U. S. Navy, Chairman.

LIGHT-HOUSE ESTABLISHMENT,
OFFICE OF THE LIGHT-HOUSE INSPECTOR, 10TH DISTRICT,
BUFFALO, N. Y., Sept. 26th, 1899.

Notice is hereby given that Ballard Reef channel (middle) gas buoy No. 3, which was recently reported as having been dragged out of position about 100 feet to the westward, the lens broken and the light put out by some unknown vessel, has been restored to position and relighted.

By authority of the Light-House Board:

FRANKLIN HANFORD, Commander, U. S. N.,
Inspector 10th Light-House Dist.

THE reorganized Hillman Ship & Engine Building Company, which has taken over the old Hillman ship building plant at Philadelphia, has issued a prospectus. Frank Samuel, a prominent iron and steel jobber of Philadelphia, is one of the backers of the enterprise. It is stated that the new company will be incorporated under a Pennsylvania charter with a capital of \$750,000, and will own absolutely the yards, machinery, good-will and in fact everything attaching to the Hillman property. John Dougherty, of New York city, who was formerly with the Wm. Cramp & Sons Ship and Engine Building Company, will be president, and Harry Krominsky, also at one time with the Cramp Company and later affiliated with the Columbian Iron Works at Baltimore, will be general manager. The yard is to be improved by a new equipment of modern machinery. It is said that new tools for the boiler shop will entail an outlay of at least \$65,000.

CONCERNING LAKE LEVELS.

The correction of the natural outlets of the lakes and the construction of artificial ones has raised the question as to their effects upon lake levels, the depth of harbors, etc.

The Great Lakes may be compared to four large water tanks at different elevations, sideways, above one another, each tank provided for carrying off the surplus water, with a conduit reaching into the next lower tank, the lowest of them discharging its surplus water into a ditch. Besides a continual supply from extraneous sources, the supply for each tank is increased by the surplus water from the next higher tank, keeping conduits filled up to a certain point, the water stages varying with the supply.

If, in an arrangement as described, one of the tanks becomes leaky, or any of its contents is diverted into a new channel not emptying into the old system, all points of the system below the point of leakage or tapping will suffer a diminution of the supply which, as a consequence, will lower the previous water stages.

According to Henry Law, civil engineer, the velocity in channels of the same depth and width throughout, equals 91.44 multiplied by the square root of the product of the sectional area and the tangent of inclination of the water surface, divided by the square root of the wetted perimeter (see Mathematical Tables, by Henry Law and Professor Young, page 53). As the volume of water carried off equals sectional area multiplied by velocity, the volumes for different water stages are as the square roots of the third power of the sectional areas, the small difference in the wetted perimeters and in the inclination being neglected. Therefore, if the volume of water for a certain stage is known, it is easy to find it for another stage not widely differing from the former. According to the preceding formula the following table shows, in figures, the relations between increased sectional areas and discharges:

TABLE I.

Sectional Area.	Discharge.
1.00	1.000
1.05	1.076
1.10	1.151
1.15	1.233
1.20	1.315
1.25	1.398

This table shows, for instance, that, if the sectional area is increased 20%, the discharge increases 31.5%, etc.; and that the discharge increases faster than the area of cross section. The effect of dredging is hereby illustrated.

For rivers of irregular shape and depth, the cross sections of least area determine the outflow, dividing the river into sections of different lengths, with different velocities, but the discharges of the different sections may be assumed to be alike and to follow the same law as in channels of regular shape.

The tapping of the Great Lakes by the Chicago drainage canal affects directly Lake Michigan, Lake Huron and Georgian Bay, all being of the same level. According to Thompson's Coast Pilot those waters represent an area of 22,000, 21,000 and 5,000 square miles, respectively; in total, 48,000 square miles.

The cubic contents of a body of water of one square mile one inch deep equals $\frac{5280 \times 5280}{12} = 2,323,200$ cubic feet, consequently 48,000 square miles one inch deep represent

$2,323,200 \times 48,000 = 111,513,600,000$ cubic feet.

The discharge of the drainage canal is said to be 10,000 cubic feet per second. A day of 24 hours equals 86,400 seconds, and a year has 365 times as many seconds. Hence, the discharge per year will be $86,400 \times 365 \times 10,000 = 315,360,000,000$ cubic feet. Therefore, the depth required to offset this yearly drain is $\frac{315,360,000,000}{111,513,600,000} = 2.83$ inches.

or in round figures, 3 inches.

But assuming the discharge to be 17,000 cubic feet per second, as some people have it, the depth required will be $\frac{17,000 \times 2.83}{10,000} = 4.811$ inches, or nearly 5 inches, by which

the surface of Lake Michigan and Lake Huron will be permanently lowered.

To determine the effect which a lower level of Lake Huron will have upon Lake Erie and its connecting link, the formula mentioned above may be transformed by substituting depths for areas, because the sectional areas are

nearly as the depths. Thus, we find, that the discharges are as the square roots of the third powers of the average depths. By average depth is understood the average depth of a cross section of least area. As the discharge of Detroit river is said to be 230,000 cubic feet per second, the decrease of the discharge on account of a lower level of Lake Huron is easily found. This decrease would diminish the supply of Lake Erie and affect its water level over its whole area of about 10,000 square miles to a certain depth, if not counteracted by the increase of head, as illustrated by the following table:

TABLE II.

1	2	3	4	5	6
Average depth of cross section at present reduced 5 in.	Discharge of 1 reduced to	Decrease of discharge of Detroit river.	Per cent.	Cu. ft. per second.	Displacement of a body of water as large as Lake Erie. Deep, inches.
10	9' 7"	0.9382	6.18	14,214	19.30
11	10 7	0.9437	5.63	12,949	17.58
12	11 7	0.9484	5.16	11,868	16.11
13	12 7	0.9523	4.77	10,971	14.89
14	13 7	0.9557	4.43	10,189	13.83
15	14 7	0.9586	4.14	9,522	12.93
16	15 7	0.9612	3.88	8,924	12.11
17	16 7	0.9635	3.65	8,395	11.40
18	17 7	0.9655	3.45	7,935	10.77
19	18 7	0.9673	3.27	7,521	10.21
20	19 7	0.9689	3.11	7,153	9.71

Column 6 is obtained by multiplying the figures in column 5 by $0.0013574 = \frac{86,400 \times 365}{2,323,200 \times 10,000}$ Column 6 shows how

many inches the level of Lake Erie would be lower if the volume of its present outflow remained unaltered. But as a lower level diminishes the outflow and increases the head, and, consequently, the supply, the level would rise again long before the lowest stage were reached, and the deficiency partly be made up, as it were, by suction from Lake Huron. The figures in column 6, however, are of further interest as they show at what stage the discharge of the connecting link will equal the present or original discharge. The coincidence of these figures with those further on in Table III, column 3, is surprising and proves that the area of Lake Erie (10,000 square miles) answers exactly the requirements of a fixed relationship between the two lakes.

If, in the fundamental formula mentioned above, the "head" divided by the length of the conduit is substituted for tangent of inclination, the discharges are as the square roots of the product of the third power of the average depth and the head, from which, by transformation, are found the following neat expressions:

Let x and y equal the lowering of the surface of Lake Huron and Lake Erie respectively, e equal the average depth and h equal the original head. Q equal the original discharge, and R the altered discharge on account of a lower level, then is:

$$(1) \frac{Q - R}{Q} = \frac{(3h + e)x - ey}{2eh}$$

$$(2) \frac{Q - R}{Q} = \frac{3x \text{ when } x = y}{2e}$$

$$(3) y = \frac{(3h + 1)x}{e} \text{ when } Q - R = 0$$

$$(4) y - x = \frac{3hx}{e} \text{ when } Q - R = 0$$

When $x = 5$ inches and $e = 8$ feet, the difference in level between Lake Huron and Lake Erie (formula 2) transforms into:

$$(2a) \frac{Q - R}{Q} = \frac{5}{8e};$$

formula (3) into:

$$(3a) y = \frac{10 + 5}{e} \quad (3b) y = \frac{120 + 5}{e}$$

And formula (4) into:

$$(4a) y - x = \frac{10}{e} \quad (4b) y - x = \frac{120}{e}$$

In (3b) and (4b) y and x are expressed in inches when e is in feet. $y - x$ is the difference in the "head."

TABLE III.

1	2	3	4
e Feet.	When $x = y$ and $Q = 100$. $Q - R$.	When $Q - R = 0$ Erie level lower. Inches.	When $Q - R = 0$ head increases. Inches.
10	6.25	17.00	12.00
11	5.68	15.91	10.91
12	5.21	15.00	10.00
13	4.81	14.23	9.23
14	4.46	13.57	8.57
15	4.17	13.00	8.00
16	3.91	12.50	7.50
17	3.68	12.06	7.06
18	3.47	11.67	6.67
19	3.29	11.32	6.32
20	3.13	11.00	6.00

A comparison of column 2 in the preceding table with column 4 in Table II shows a pretty close agreement, as it should be, because the head in both cases is considered constant. When $Q - R = 0$, $R = Q$, that is, Lake Erie level has fallen and its head been increased to such a point where the supply from Lake Huron, respectively, Detroit river will have attained its original magnitude, all under the assumption of the discharge of Lake Erie not being affected and remaining constant.

As there is reciprocity between height of level and discharge there must be a point or level in a water basin where supply and discharge compensate one another and have come to an equilibrium. As the discharges for a level surface are as the square roots of the third power of the average depth we obtain by transformation, the difference of discharge equal $\frac{3y}{2d}$, y representing the difference in level

and d the average depth of the controlling cross section. Hence, to balance the supply and discharge, we have the following expression:

$$\frac{3y}{2d} = \frac{(3h + e) - y}{2eh} \quad [\text{See formula 1}].$$

From which follows, that

$$y = \frac{d(3h + e)x}{e(3h + d)}$$

Therefore, $\frac{y}{x}$ is a constant quantity.

Assuming $x = 5$ inches; $d = 18$ feet, $e = 12$ feet and $h = 8$ feet.

$$y = \frac{18(24 + 12)5}{12(24 + 18)} = \frac{18 \cdot 36 \cdot 5}{12 \cdot 42} = \frac{3 \cdot 3 \cdot 5}{7} = \frac{45}{7} = 6.43 \text{ inches}$$

In other words, Lake Erie level will be lowered 6.43 inches when Lake Huron level is lowered 5 inches, provided the controlling sections at present are on an average 18 and 12 feet deep, respectively.

As regards the Chicago drainage canal, its great defect is, that no gates are provided for shutting off the lake water. This neglect threatens not only the country at the lower end of the canal with inundation, but also threatens Lake Michigan and its connecting waters to be drained several feet, if a break in the canal should happen. Such a calamity would paralyze the whole lake traffic. In view of the enormous interests at stake, it is about time that the federal government be petitioned to secure such safeguards as will regulate the outflow of the canal, and prevent disaster to spread over the whole country.

JOHN MAURICE,
Civil Engineer and Nautical Expert.

Chicago, Sept. 26, 1899.

MARINE INVENTIONS.

Patents on marine inventions issued Sept. 26, 1899. Reported specially for the MARINE RECORD. Complete copies of patents furnished at the rate of ten cents each.

633,705. Sail-rig for ships. A. V. Smith, San Francisco, California.

633,811. Bascule lift-bridge. J. P. Cowing, Cleveland, Ohio.

633,873. Apparatus for cleaning hulls of vessels. David Mason, New York, N. Y.

633,903. Buoyant propeller. G. H. Pond, Ashburnham, Mass.

633,904. Ballast device. J. P. Pool, New York, N. Y.

633,910. Machine for cleaning ships' bottoms. John Schnepf, New York, N. Y., assignor of one-half to W. C. Doscher, same place.

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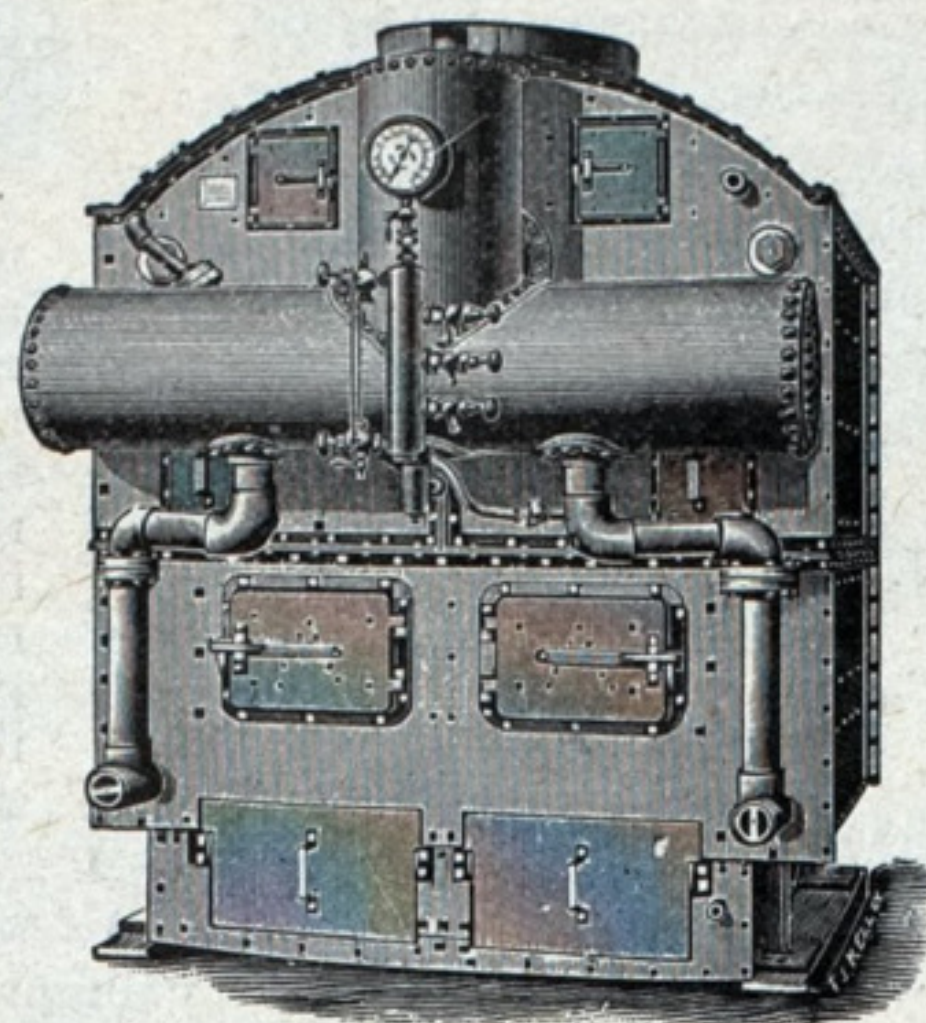
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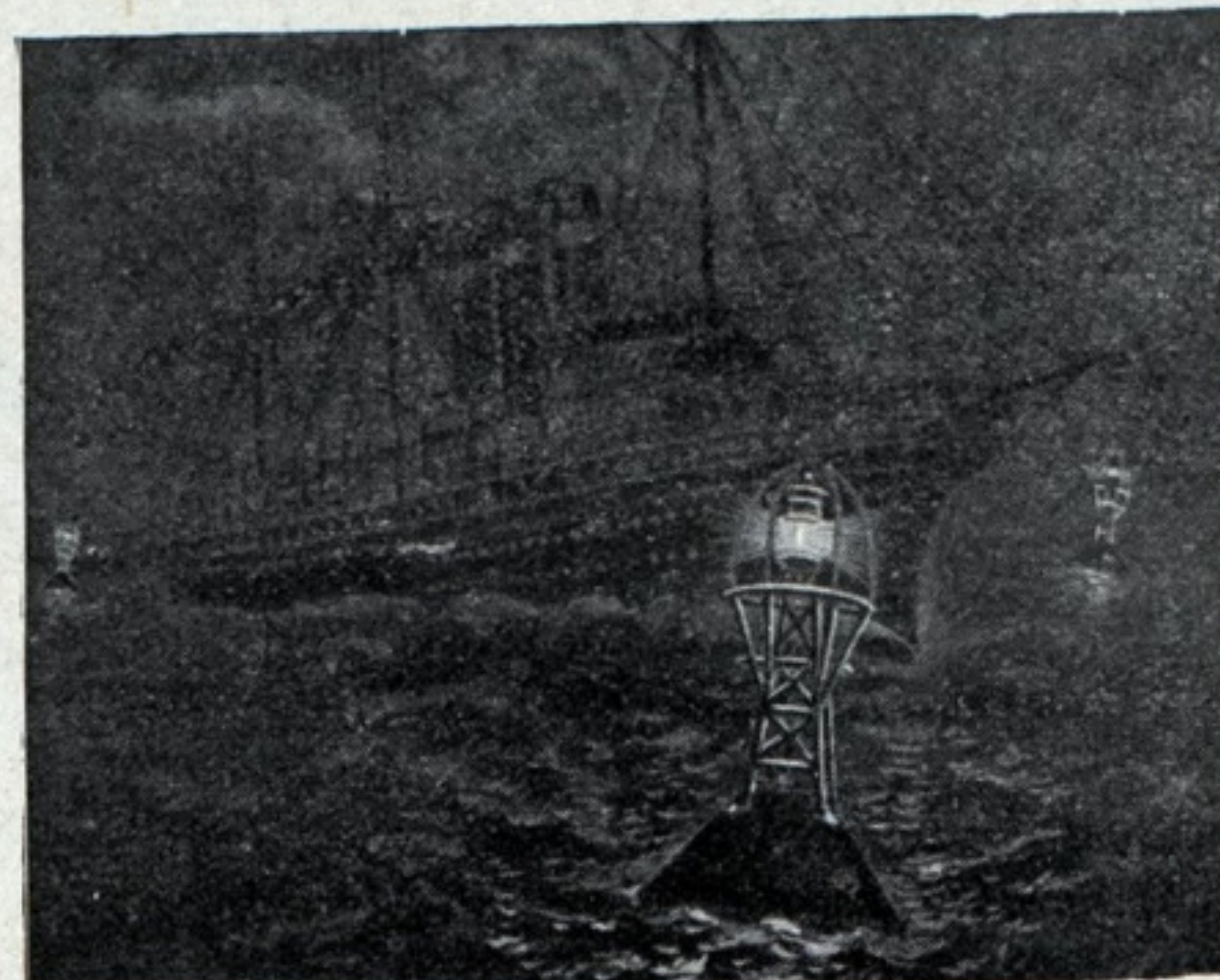
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WATER-TIGHT DOORS.

(ILLUSTRATED.)

Water-tight doors in bulkheads, their structure, efficiency and methods of handling, has occupied the attention of shipbuilders, owners and underwriters in a greater or less degree for a period of several decades and yet nothing totally reliable and satisfactory has ever been brought forward. In this connection a Cleveland firm seems to have solved the problem with what is called the "Long-Arm" system.

Heretofore there has been no attempt to manufacture doors for ships; doors have been built, and built of as many designs and sizes as there have been notions and fancies among those who build and sail ships. In view of modern methods and progress in similar matters this seems to be much behind the age.

From the commencement of shipbuilding in metal especial attention has been laid upon the importance of water-tight compartments to insure stability and flotation in case of skin-puncture.

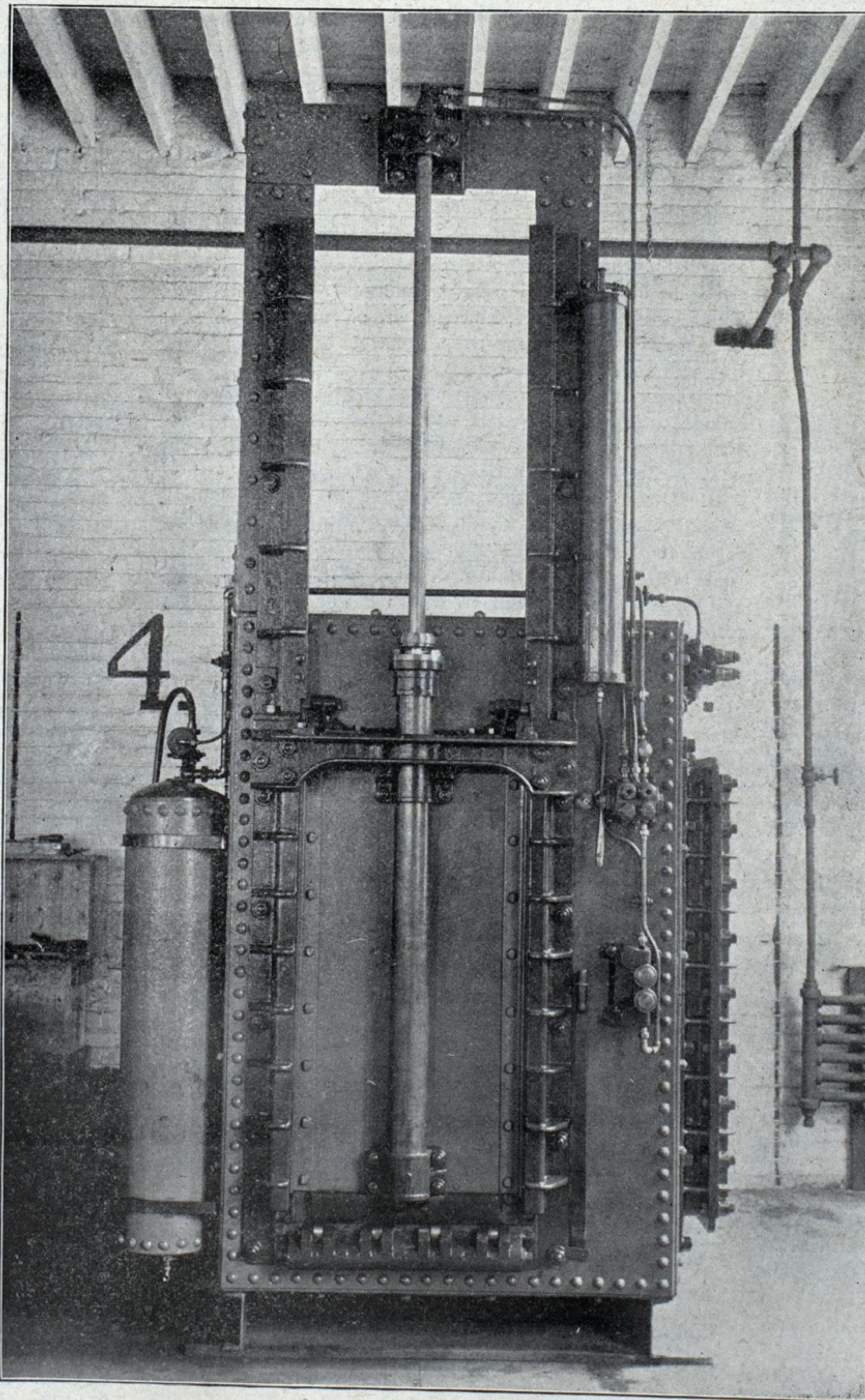
The use of a compartment system has been insisted upon from the very start; underwriters, classification societies, shippers and the traveling public have become more and far more exacting in the matter of bulkheads as the use of ships and the risk of skin-puncture advance.

Recurring disasters from collisions (including the most terrible mishaps known to modern navigation) have enforced severe requirements, involving relatively enormous expense in this feature of first-class ships.

But only within the last four or five years has attention been effectively called to the preservation of these expensive compartment systems, and to the utter fatuity of confiding in so-called "water-tight bulkheads" containing ordinary doors which render such water-tightness impossible.

The illustrations herewith shown, gives a view of the vertical and horizontally worked water-tight doors as tested and endorsed by the United States Navy and supplied by the Long Arm System Co., Garfield Building, Cleveland, O.

THERE are eight inches more rainfall annually on the south shore of Lake Superior than on the north shore, and three inches more in the cases of Erie and Ontario. There is also a greater precipitation on the eastern shore of Lakes Huron and Michigan than on the western.



(Shut and Locked.)

THE "LONG-ARM" VERTICAL SLIDING DOOR, U. S. S. CHICAGO TYPE, 6 INCH TIGHTENERS.

ADMIRAL MELVILLE'S OPINION.

Admiral Melville made some interesting remarks before a gathering of engineering experts at the Union League Club, Philadelphia, recently. The Admiral said, according to a report in the New York Tribune:

"The ships Kearsarge and Kentucky are rated at 18 knots. The expectation of the future from ships of the combined battleship and cruiser characteristics mentioned is an increase of speed to 20 knots and more. Some of the modern British ships of this class are claiming 19 knots. I am confident in our new ships of doing even better than that. We have two big ships ordered by Congress, but the contracts are not yet let. We have fifty-two vessels, from torpedo boats up to battleships, all of the latest designs and unsurpassed in the world for efficiency and speed. It is doubtful whether any more of the heavy class will be constructed. The designs of the future tend to higher speed and about 15,000 tons displacement. The French have ships going as high as 22 or 23 knots an hour. They have lighter batteries and lighter armor. That is the policy of naval construction for the future.

"We are also tending toward tubular boilers, permitting of higher pressure of steam, greater grades of expansion, giving us greater economy of fuel. Yet this is not an unmitigated gain, because it requires a higher grade of intelligence in supervision and in making repairs.

"The great problem of the future is to have men who can properly direct and manipulate these great fighting machines. The whole ship's company, officers and men, must now be educated and trained mechanics—to use a terse French word—and electricians.

"The official reports of the war with Spain show most satisfactory results. There was not a 'skyrocket' engine or ship—that is, one which starts with a spurt and drops like a stick. All were durable and reliable. It is remarkable, but nothing gave out, and even repairs were down to a minimum, not exceeding the proper care of the same class of ships in time of peace. A few torpedo boats were struck and needed repairs, but their performances were splendid.

"I often think what a mistake Senator Sumner made in defeating the annexation of San Domingo. Samana Bay is the greatest harbor in the world. It is far superior to anything we secured in the Spanish war. General Grant always looked a long way ahead. St. Thomas was cheap. That was another place we should have taken. I believe in Monroe doctrine. We can take care of everything on this side of the water."

VESSELS CLASSED.

Vessels classed and rated by the American Bureau of Shipping, New York, in the "Record of American and Foreign Shipping:" Screw, El Norte, owned by the Southern Pacific Co.; screw, Aransas; tern, Samuel Dillaway; tern, Morris W. Child; half brig yacht, Alcha; schooner, Frank A. Palmer; schooner, Independent; barg, C. R. R. of N. J. No. 14; bark, Charles B. Kenney; British bark, Lizzie Curry; British bark, Bessie Markham.

SEA TERMS.

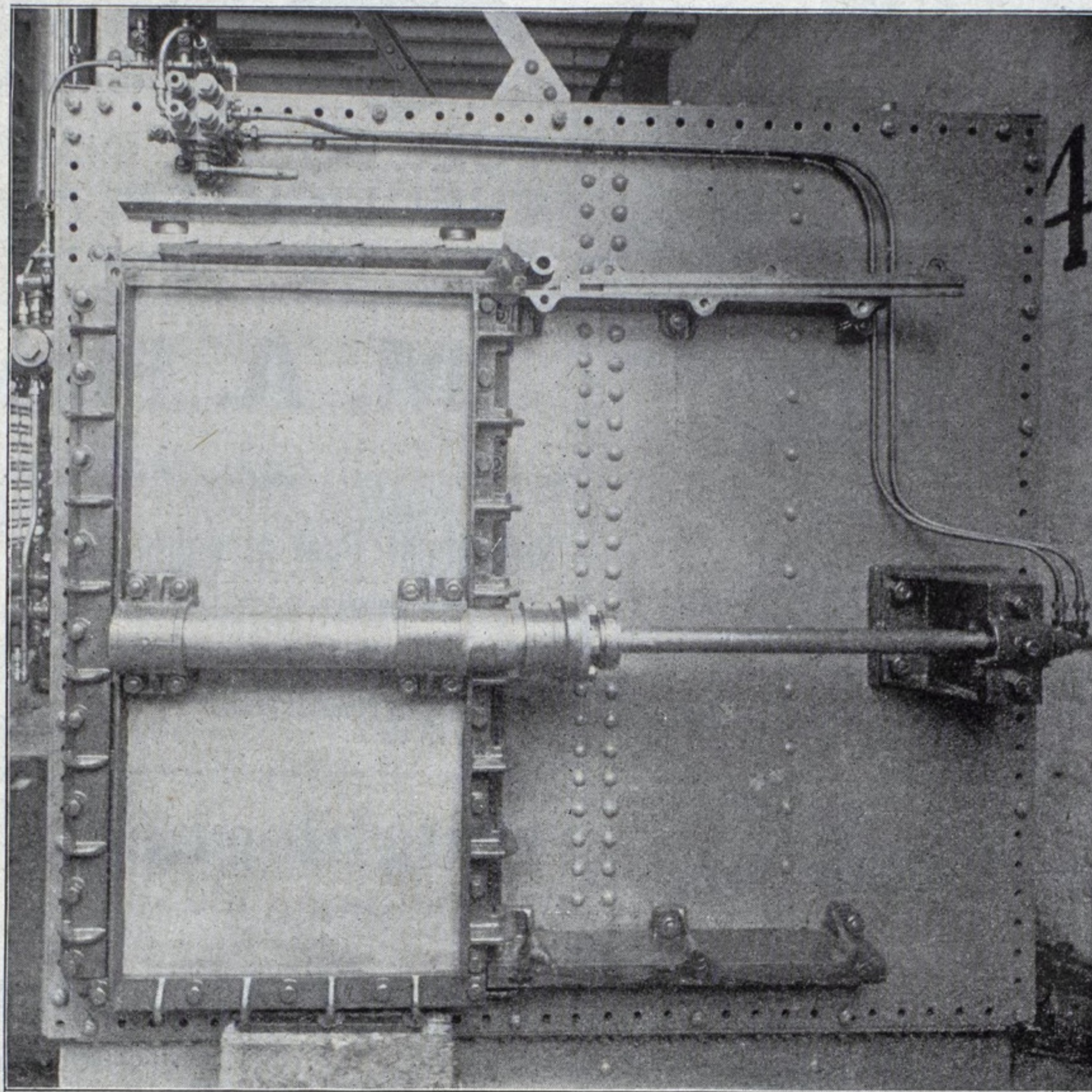
A writer in the New York Tribune recalls the fact that many nautical terms not familiar on shore are of Scandinavian origin. Landsmen speak of a sheet of paper, but at sea we have sheet ropes from the Danish "sceat," the point or corner of the sail to which the rope is attached. The sailors called "rat lines" so simply because they are "rat lines," or if you like, "rad lines;" the landsman "runds" or call them "rangs," or "gradus," according as they may be half French, whole French, or Roman, but the idea is the same—steps, ranks, rows, things set all arow. As for the cat tackle, cat block, the cat head, the cat tail, catch tackle, catch block, and so on, would be more correct. The anchor is "seized up" by these apparatus, or, as they said in old times, "caught," when it is not a trip or on the swing. English-speaking landlubbers have consecrated the word "shroud" to the clothing of the dead only, but the ship carries her shrouds all her life—"scruds" the Danish Scotch call them. You have only to look at a full rigged ship to see how appropriate the name is.

"Starboard" is a corruption of "stear board." In the very early days the snake boats had no rudders on their stern posts, but were steered, or stear-ed, by means of large paddles, or "rodres," rigged out always on the steerer's right, so as to give more purchase to his left, or weaker arm. That made the right side, or board, of the "skip" the "stear board," just as their end is the "stearn," which we ignorantly spell "stern," and pronounce to rhyme with "burn." The other side of the hull, which, having no "rodre" on it, could be brought sheer up to the wharf for lading, was the "lade board," and this became, by the attrition of use, the "labbord," wrongly spelled "lar-board."

When it blows very hard sailormen begin to talk Saxon. They take in a "reef." "Wrinkle" has taken the place of "reef" on shore, except in west of England hamlets. The Danes, when they wanted to shorten sail "swifted" them. Under the same tempestuous circumstances, passengers often talk of going "between decks," and "deck" is plain Saxon for "cover." People used to "deck their

heads" when they put on their hats. Nowadays the phrase would suggest to a landsman the use of floral decorations, but the Saxon word "decan" had no connection with the Latin derivative. In a heavy gale, too, the skipper talks to his mate about a "lee shore," and "lee" or "le" is the Saxon for shelter—not meaning that a lee shore shelters, but that it is not in the sheltered, or offwind direction.

harpoon. "Sprit" is the Scandinavian for a small stick; it appears in "bow sprit" and "spritsail." "Boom" is the Low form of the High German "baum," of course, and was the older word for "tree," the earlier meaning of which latter—timber, or wood; the material of the tree, not the whole thing—has survived at sea in "cross trees," which means, in land-lubber ling, "transverse timbers."



(Shut and locked; top stiffener, roller bar and back guide displaced.)

THE "LONG-ARM" HORIZONTAL SLIDING DOOR, U. S. S. CHICAGO TYPE, 9 INCH TIGHTENERS.

THE HOLLAND SUBMARINE TORPEDO BOAT.

The submarine torpedo boat Holland made a remarkably good showing during a practice on Saturday last in Little Peconic Bay. The new diving apparatus for operating the steering engines worked successfully, the boat getting under water and completely out of sight in quick time.

The trial was in sending the boat over a mile course submerged, at the end of which she came to the surface and the torpedo was discharged from the tube. The run under the water was made in about ten minutes, and the torpedo was successfully discharged, from the tube, but, owing to what is thought to have been a disarrangement of some of the mechanism, the torpedo, instead of taking a straight course, took a downward turn, and the volume of muddy water sent up showed that it struck the bottom about 50 feet from the bow of the boat.

W. R. Eckert, consulting engineer for the Standard Electric Co., of Chicago, and also for the Union Iron Works, of San Francisco, inspected the vessel and examined the machinery while she was running under water. He said: "I am very much pleased with the exhibition, and am convinced that there is no trouble for the boat to do all that is claimed for it. I would rather be, and feel safer in the Holland boat when under water, than in the engine or firerooms of any of the fast torpedo boats. I consider her absolutely safe."

First Yachtsman—"That Miss Topsail makes me tired with her talk about yachts." Second Ditto—"Why?" First Yachtsman—"I told her I had put a new binnacle on my yacht, and she asked me if I scraped all the old ones off the hull!"—Boston Transcript.

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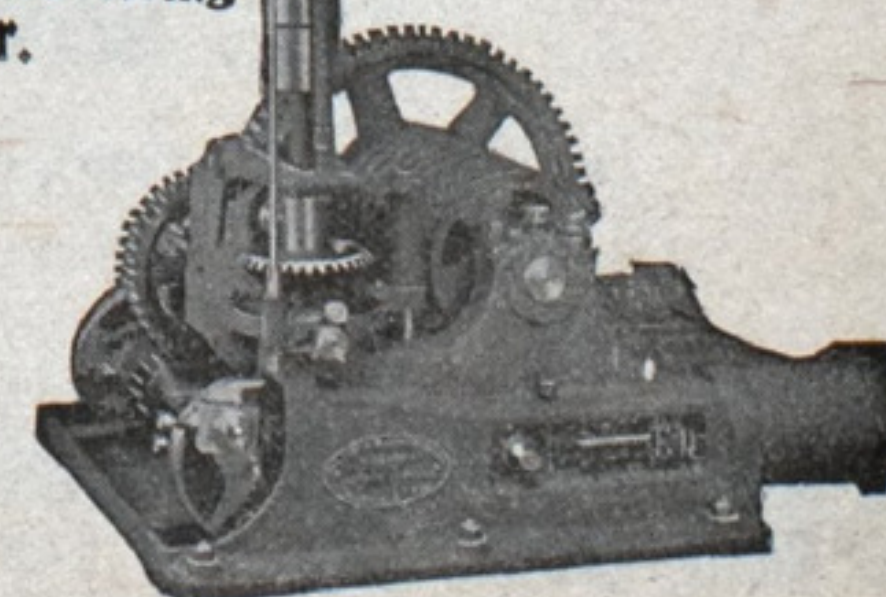
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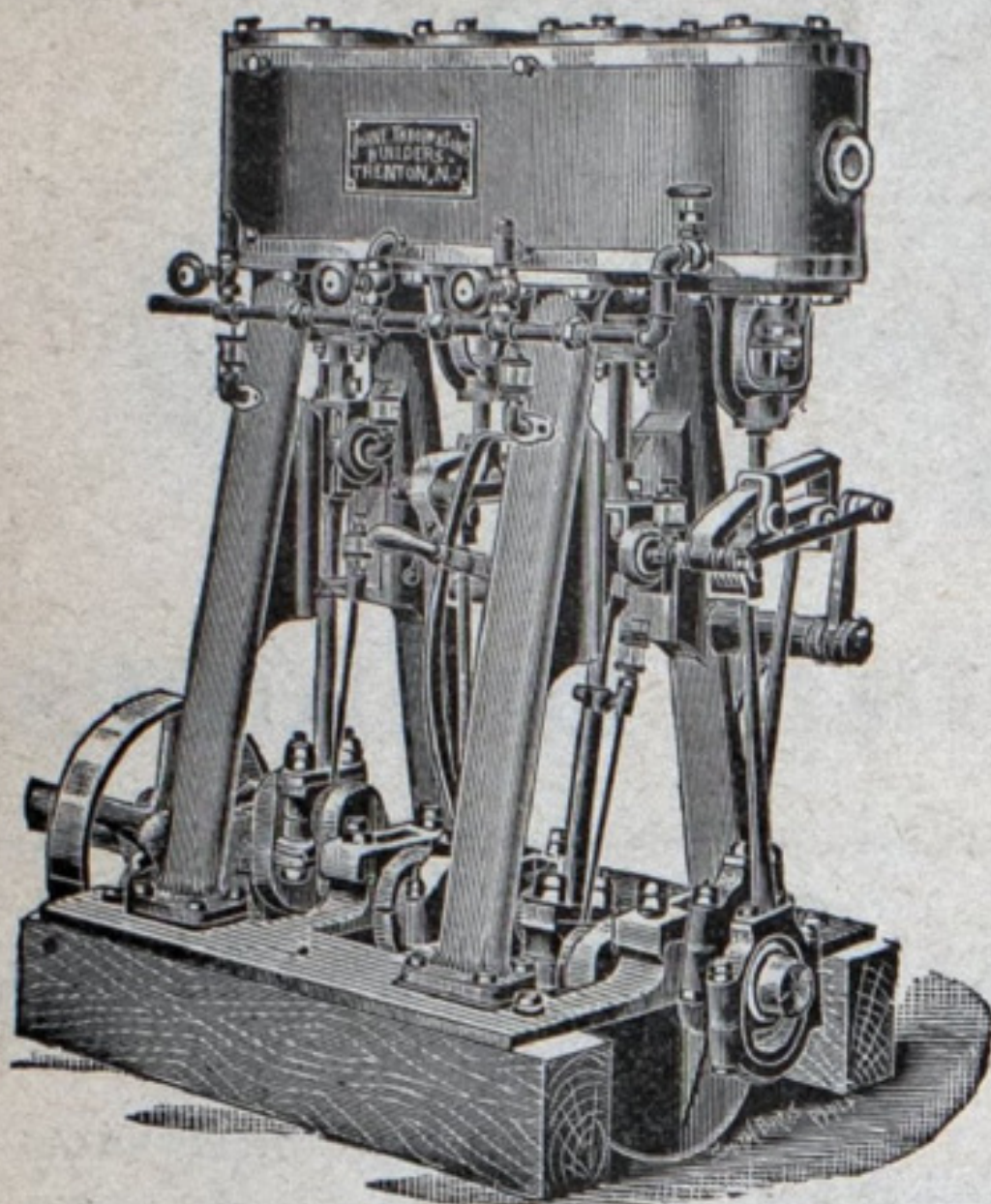
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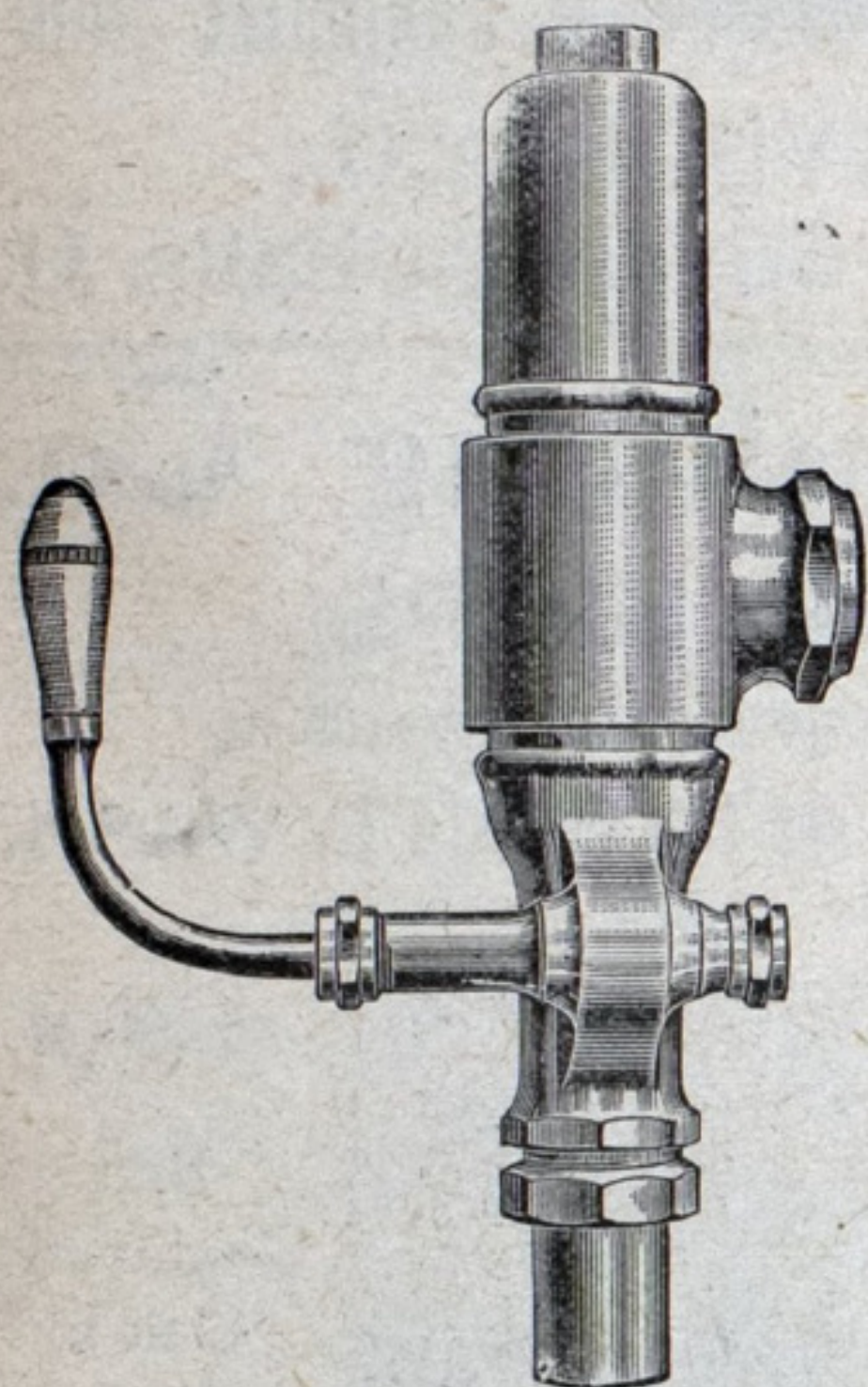
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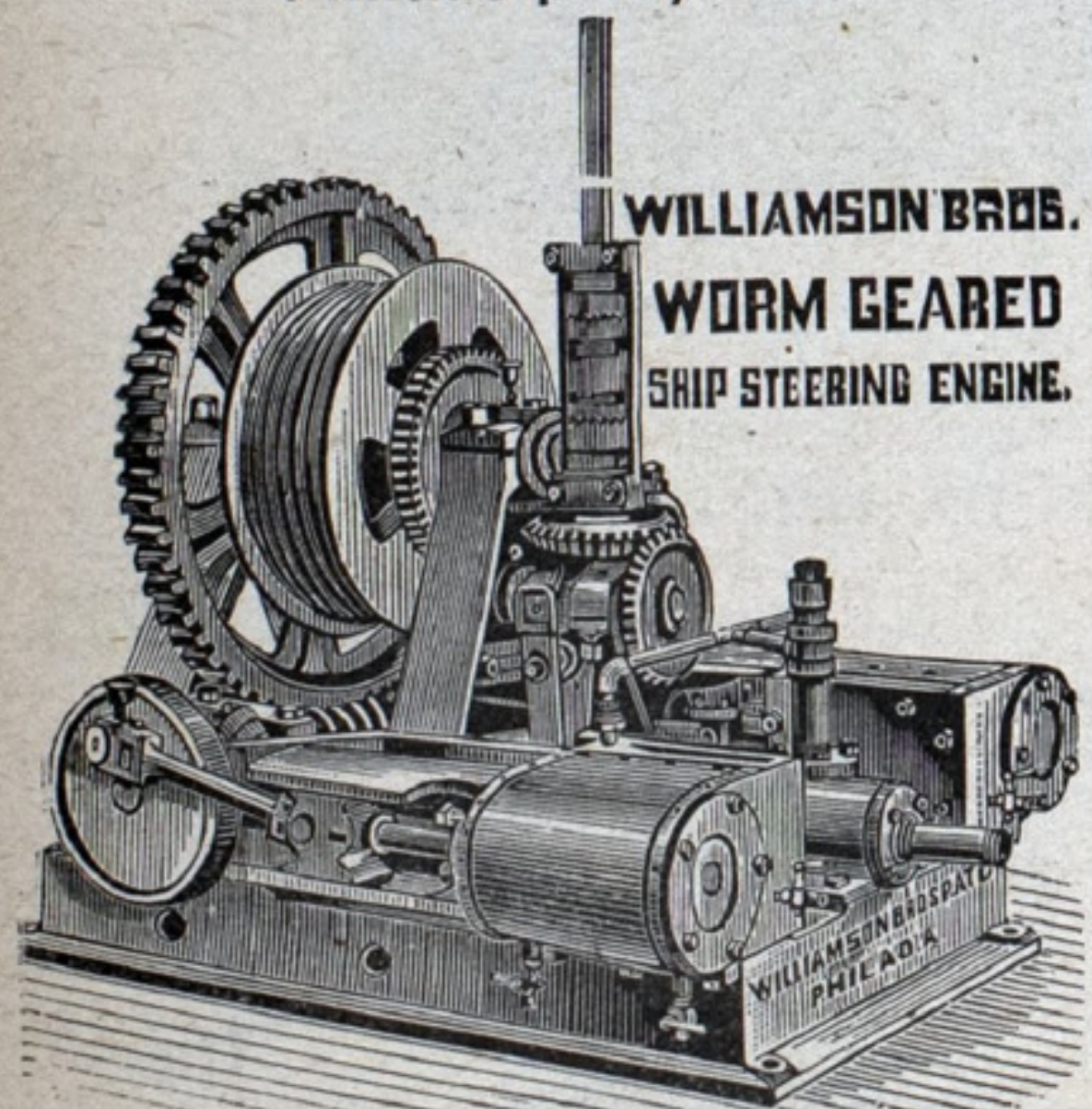
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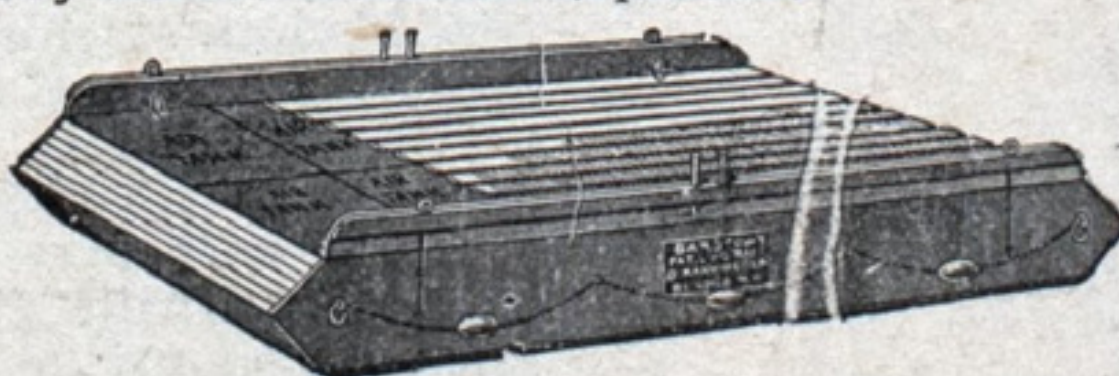
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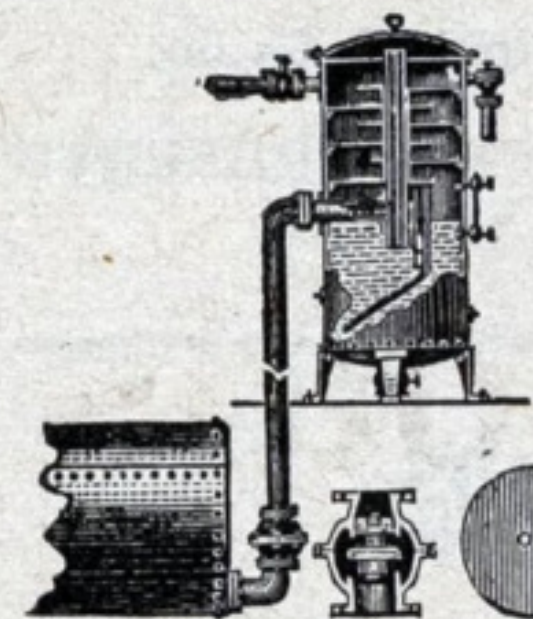
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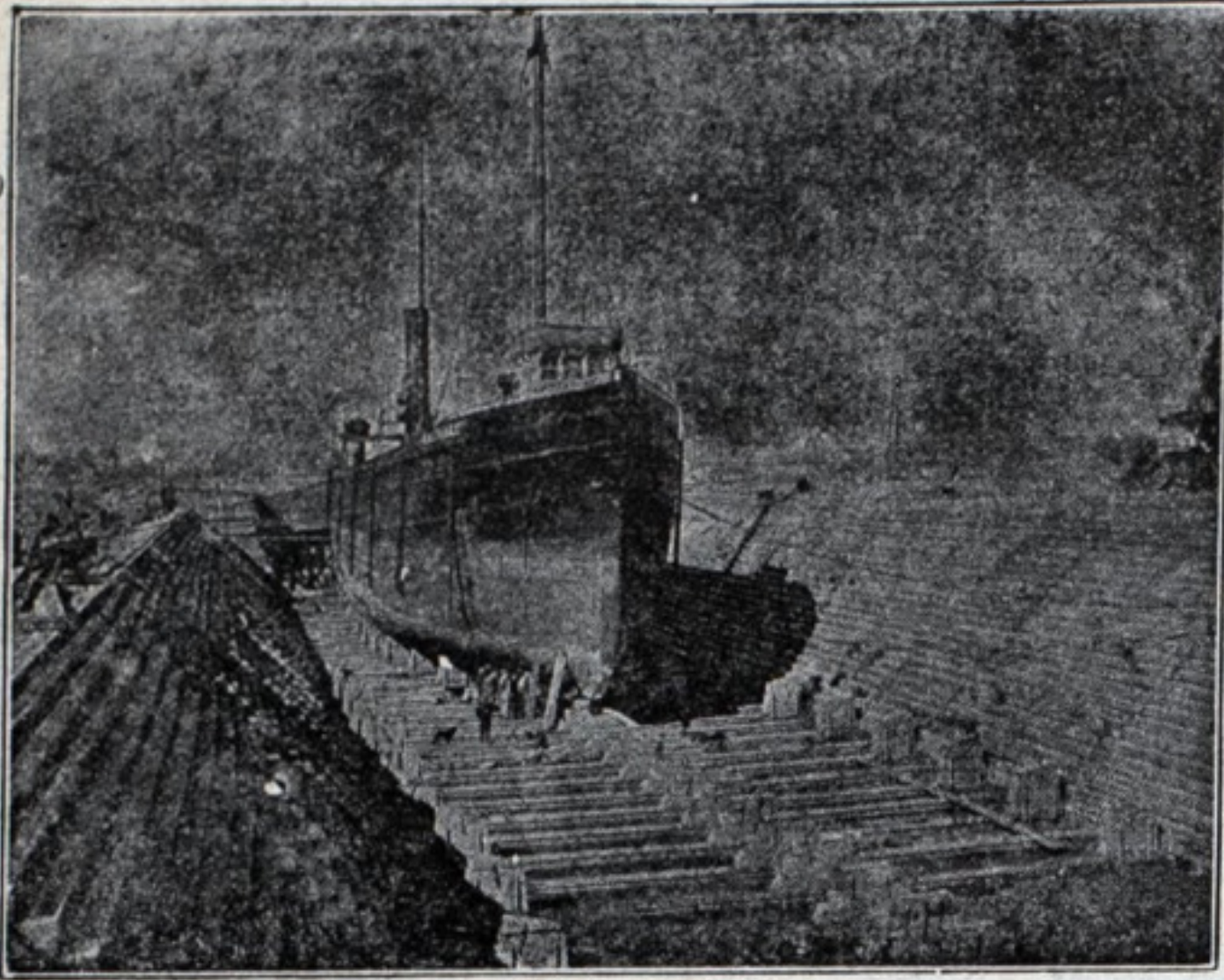
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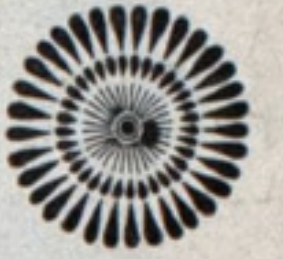
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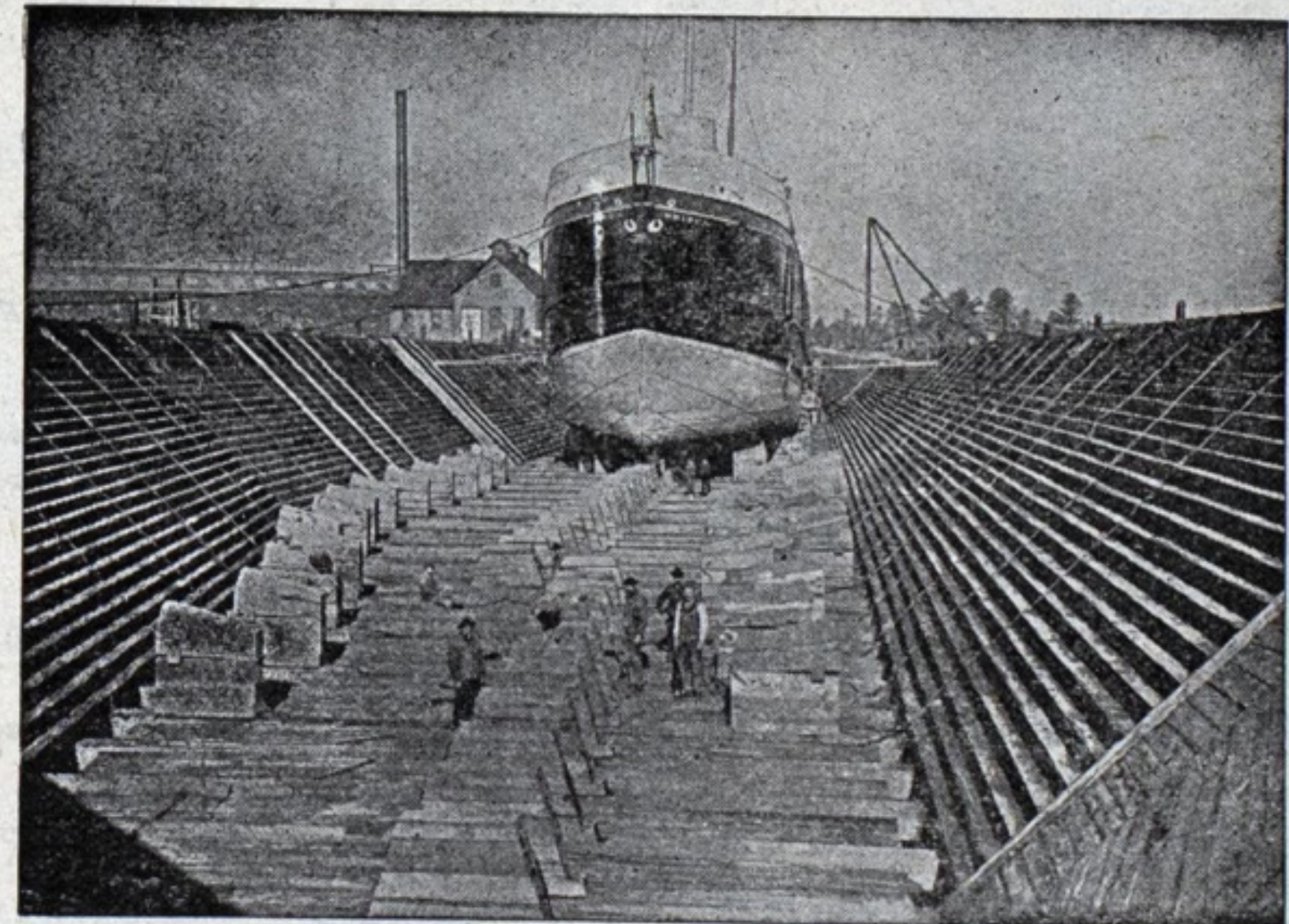
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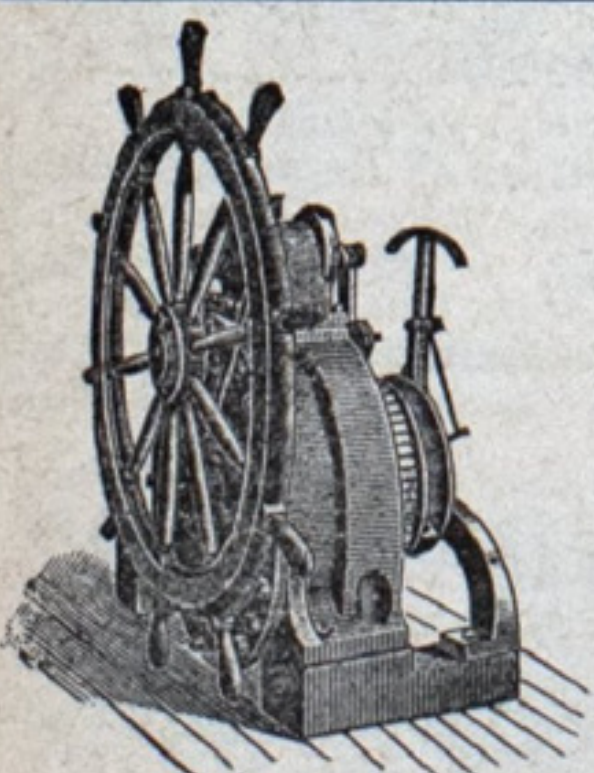
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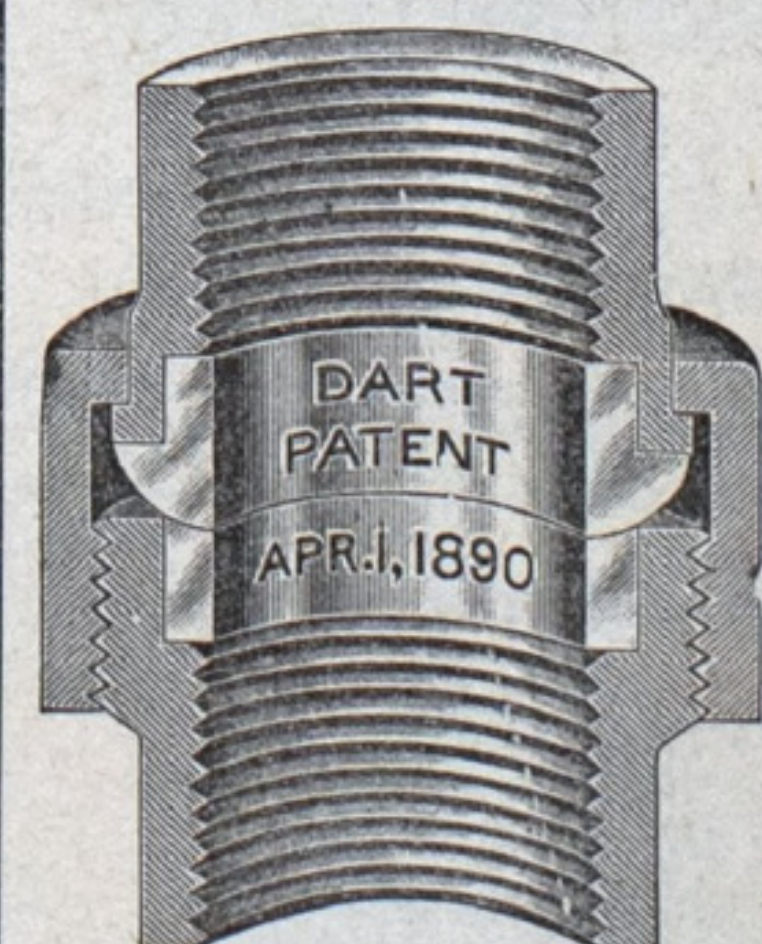
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